eDEP

User Guide

eDEP

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1 INTRODUCTION

The aim of this document is to assist eDEP users with the activities of platform installation, configuration and launching.
For more information concerning the platform design the reader should address either the Architecture Design Document (ADD) or the Detailed Design Document (DDD).

1.1 REFERENCES

Ref	Title	Doc Reference	Authors	Date
1	eDEP Architecture Design Doc.	GL/eDEP/ADD/1 V1.8	M. Vere	March 2003
2	eDEP GSDK Detailed Design	1.5	M.Vere	October 2002
3	eDEP ATC Detailed Design	GL/eDEP/DDD/1/1.9	M. Vere	March 2003
4	IPAS ACE 2004B External Interface Requirement Specification.	version 6.1		1 March 2004
5	eDEP_SPD_ADD.doc (the Sector Package Demonstrator ADD)	Version 1.2	S.Owen	Latest
6	eDEP_FlightLeg.doc	GL/eDEP/FL/001	S. Owen	Latest
7	eDEP Software Configuration Management Plan	GL/eDEP/TN/1/1.0	M. Humphrey	May 2007

1.2 DOCUMENT CHANGE HISTORY

Release	Author	Release Date	Release Description	Modifications (sections affected and relevant information)
0.50	Graffica (Vere)	25th Aug 2005	Added resource to allow STCA filtering on CFL.	Section 5.3.1.6
0.51	Graffica (various)	2nd Jan 2006	Added various resources. Improved ILS description. Added additional flight plan attributes.	Sections 5.3.1.4, 5.3.1.6, 5.3.1.7, 5.3.1.9 Section 6.1.8 Section 6.2.1
0.52	Graffica (Owen)	10th Jan 2006	Added SPD resources	Sections 5.3.1.6, 5.3.1.12, 5.3.1.7
0.52	Graffica (Vere)	16th Jan 2006	Added new resources relating to changes for FASTI.	Sections 5.3.1.4 and 5.3.1.7
0.53	Graffica (various)	25th April	Various resources added/modified. MAFF conversion added.	Section 5.3.1.6, 5.3.1.7, 5.3.1.9, 7.7.1
0.54	Graffica (various)	5th July 2006	Various resources added.	Section 5.1.5, 5.3.1.6, 5.3.1.7, 5.3.1.9
0.55	Graffica (various)	26th Oct 2006	Various resources added.	Section 5.3.1.4
0.56	Graffica (Humphrey)	27th Nov 2006	Added recording stream reset resource.	Section 5.3.1.2
0.57	Graffica (Humphrey)	14th Dec 2006	Added LOA to airspace file description.	Section 6.1.5
0.58	Graffica (Owen)	28Feb2007	Add TP resource for multiple TP servers.	Section 5.3.1.6
0.59	Graffica (Owen)	28Feb2007	Added FM resource FM.XFL_MODEL.TOCBOD .TOLERANCE Added CFMU-eDEP converter resources.	Sections 5.3.1.6, 1.1.1.1
0.60	Graffica(Rawlings)	5Apr2007	Various graphics resources added.	Section 5.3.1.4
0.61	Graffica (Kirkwood)	11 Apr 2007	Updated ARTAS resources	Section 5.3.1.6

Release	Author	Release Date	Release Description	Modifications (sections affected and relevant information)
0.62	Graffica (Hargreaves)	16th Apil 2007	Added resource descriptions for filtering.	Section 5.3.1.7
0.63	Graffica (Vere)	23rd Apil 2007	Added resource for SIL committed PEL display	Section 5.3.1.7
0.64	Graffica (Humphrey)	4th May 2007	Removed sections now contained in SCMP	Sections 3 and 4.2.
0.65	Graffica (Stainton)	29th May 2007	Added stca resource to select track sources	Section 5.3.1.6
0.66	Graffica (OWEN)	07 Jul 2007	Remove REC and CFMU resources which are now in the eDEP_EEC_DDD	Section 5.3
0.67	Graffica (Hargreaves)	07 August 2007	Added resource descriptions for height filter range	Section 5.3.1.4
0.68	Graffica (Kirkwood)	10 August 2007	Added IAS.GENERATE_DAP resource.	Section 5.3.1.6
1.0	Graffica (Thom)	13th August 2007	Version number change to common Graffica standard	N/A

1.3 ABBREVIATIONS

Abbreviation	Meaning
CWP	Controller Working Position
IDE	Integrated Development Environment
JRE	Java Runtime Environment
JVM	Java Virtual Machine
PPD	Predicted Problem Display
PWP	Pilot Working Position
SDK	Software Development Kit
AVT	ADS-B and TIS-B Validation Testbed.

2 PLATFORM OVERVIEW

The following diagram shows the principal Edep component objects and their associations in the platform. Each of the data flows is described in the following paragraphs, identifying the data content of each terminator on the diagram. The labels attached to each data flow indicate the nature of the information being between Edep and the terminator.

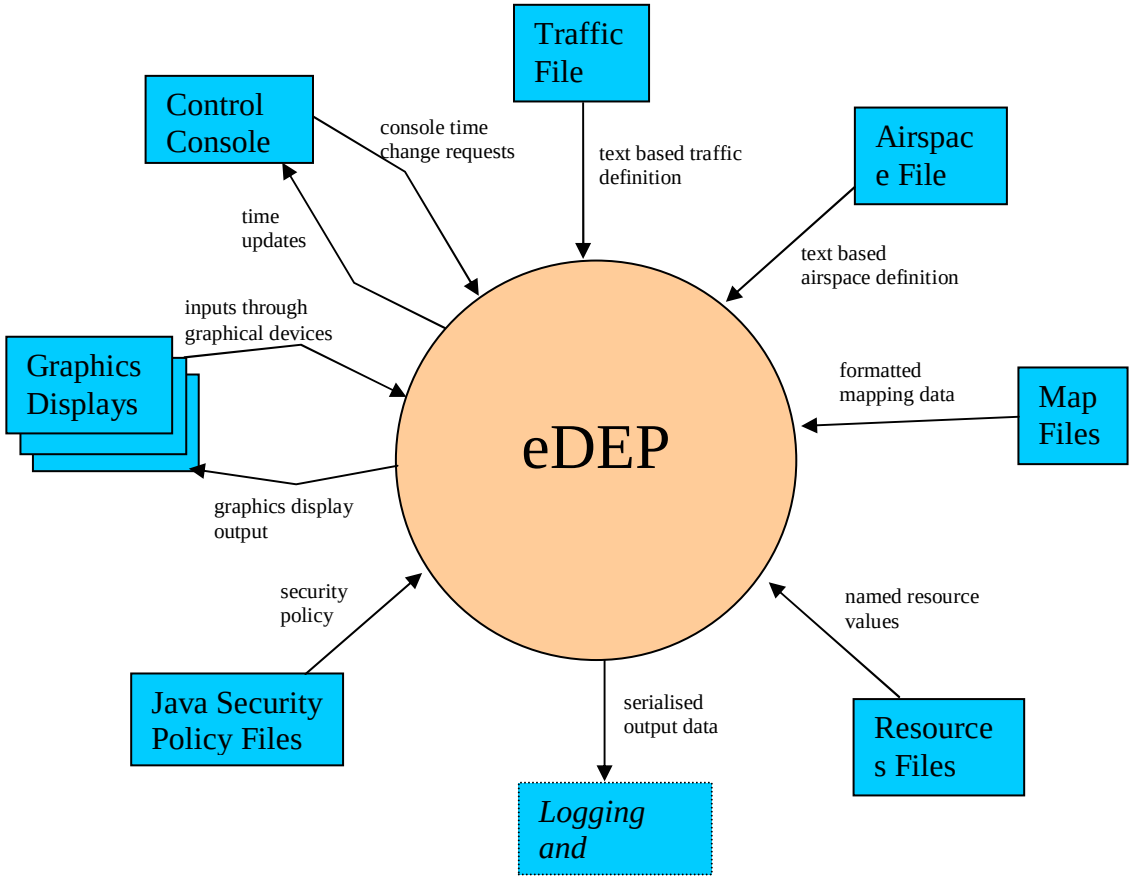


Figure 2-1 Edep Context Diagram

2.1.1 Resources Files

The resources files provide a mechanism to load named resource values into a static resource database, which can be accessed directly from any object running within a single Java Virtual Machine. The values can be the simple types Boolean, String, Integer or Real, or a complex list structure, with arbitrary sequences of values, arranged into lists. The lists can be nested to an arbitrary depth, and define an arbitrary structure. The file is referenced from the command line –r parameter. A single resource file may also load other files referenced from a designated file, using a #LOAD directive within the file.

These resource values are used to configure the source and level of diagnostic output, the required set of components to run (including the actual component class to use and the corresponding component names). It also defines the fonts, and logical and physical colours to use in the graphical components, the specific class implementations to use for key component interfaces, and the layout and configuration of graphical items. The resources files are further detailed in section 5.

2.1.2 Map Files

The ATC application may need access to map information, in particular coastline, but also terrain and feature definitions. The map file provides this information in a generic form, allowing coastline, contours, area features, linear features and point features to be defined. The default map provided is

for the UK coastline only. Further information can be found in the NIMA web site at http://www.nima.mil. The map files are explained in section 6.3.

2.1.3 Airspace File

This file provides a free formatted text description of the airspace, and contains airspace feature definitions, which include sectors, units, airspace fixes, standard routes, SIDs, STARs, airports, runways and letters of agreement. The airspace file syntax is explained in section 6.1

2.1.4 Traffic File

The traffic file provides a free formatted text description of the set of flight plans required to run with the platform. These plans define the initial flight plans (IFPL) for the flights associated with the named callsigns. These plans use information defined in the airspace file to create the plans, using either standard routes, SIDs and STARs, or using user defined routes, defining paths through any set of fixes, or indeed flying to anonymous points in space identified simply by a latitude and a longitude. Each plan can also define information about the flight including its RFL and aircraft type information. The traffic file syntax is elaborated in section 6.2.

2.1.5 Java Security Policy Files

Java security policy files need to be defined to enable the Java RMI to clear its compulsory security checks when it initialises, and when information is passed through an RMI method invocation. For standalone purposes, the file will simply grant full access rights to the process. If running across a network or over the Internet, it might be necessary to allow access only to the required data sources.

2.1.6 Graphics Displays

When running an experiment, the graphics displays will typically be provided by □ctioned□ion CWP components. The graphics may be output to MS-Windows based displays, or to Unix/Linux based X-Window based displays, depending on the host operating system being used, and the corresponding Java Virtual Machine (JVM) being run.

2.1.7 Console

The console provides a simple input and display device to monitor and control the progress of the simulation. The baseline version simply controls the rate of flow of time, and provides pause and resume functions.

2.1.8 Logging and Analysis

The logging and analysis facilities will allow inter-component messages to be logged, along with graphics events, and other I/O performed by the platform. This facility is to be completed.

3 PLATFORM & TOOLS INSTALLATION

This section has been superseded by the 'Development Environment' section of the eDEP Software Configuration Management Plan (SCMP) [Ref 7].

4 DELIVERY STRUCTURE

The Edep platform is delivered in one of two forms – as a team developer project, or as a restricted developer project. The main difference between the two deliveries is that in the former the GSDK is delivered as source code, whilst in the latter it is delivered as a compiled jar file.

4.1 CVS STRUCTURE

The Graffica developers work with the following CVS-driven directory structure.
The configured column indicates which items are configured and must be placed under configuration control.

Directory	Configured	Description
<home>	✓	.project and .classpath The Eclipse project files.
<home>/products		Contains derived products such as jar files, □ctione, class files etc
<home>/scripts	✓	Contains useful script files (.bat .csh .ant) including Edep.xml used to generate the RMI stubs.
<home>/TOOLS	✓	Contains auxiliary software such as JAXP (DOM) and Retroguard.
<home>/ATC	✓	The ATC module
<home>/ATC/scripts	✓	The script files (e.g. launch files) related to the ATC module
<home>/ATC/src	✓	The source code related to the ATC module This includes • atc – the set of reusable ATC components • atcapp – the main program classes and scenario files • test – the atc specific test software
<home>/GSDK	✓	The GSDK library module, containing src and scripts subdirectories.
<home>/ASMT <home>/CORA2 <home>/TCAS	✓	The various client applications built upon the Edep platform.
<home>/EEC	✓	The EEC module, containing EEC integration code (e.g. connections to IPAS and STORIA)

4.2 CONTINUUS STRUCTURE

This sub-section has been superseded by the eDEP Software Configuration Management Plan (SCMP) [Ref 7], namely the ‘EEC Onsite Activities’ section for the Synergy CM (previously Continuus) project organisation, and the ‘Development Environment’ section for how to work with these.

5 EDEP RESOURCE FILES

5.1 INTRODUCTION

5.1.1 Overview

The GSDK provides a central mechanism to provide named resource values to participating applications. These resources are similar to Unix shell variables, or Java properties. The Resources class provides a set of static methods to access the required resource items. These items can define the primitive values Boolean, real, integer or String. In addition, arbitrary lists of objects can be created, and can be laid out in the file using free format text. Resource names must start with an alphabetic character and may contain any alphanumeric or underscore '_' or dollar '$' or period '.'. By convention, resource names can be grouped logically by using the period character to create more meaningful names.

Resources are initialised at start-up by specifying the resource file name on the command line, by using the *–r <filename>* option. Specific resource values may also be set directly via the command line, using the *–p <resource name> <resource value>* option.

5.1.2 Resource Value Syntax

5.1.2.1 String

Strings can be introduced as a single word (if it can be read as a single token), or terminated with double quotation marks "…" to include white space or special characters.

5.1.2.2 Boolean

A Boolean value is introduced with the reserved name tokens TRUE, true, FALSE or false.

5.1.2.3 Numeric

Numeric values are read as double precision values, but stored as integer values if the number has an equivalent value to an integer.

5.1.2.4 Lists

List elements are delimited commas or white space and terminated with round brackets '(' and ')'. These lists may be homogeneous (all items of the same type) or heterogeneous (a mixture of items including nested lists to an arbitrary depth).

5.1.2.5 Comments

Double slash // comments are accepted in resource files.

5.1.3 Combining Resource values From Existing Definitions

Resource values defined in the file can be constructed by combining existing resource name values with new text items to form a new value. The items are de-referenced by prefixing the resource name with a '$' character, and combined using a '&' character. Thus the following item definitions:

```
HOME c:/users/GSDK/
DAT ".dat"
SCENARIO $HOME & "example/test_scenario" & DAT
```

Will produce the following resource value:

```
SCENARIO = c:/users/GSDK/example/test_scenario.dat
```

5.1.4 Loading Nested Resource Files

The Resources file can read nested files, embedded in the file it is currently loading, introduced by the "@LOAD" directive. This directive is followed by a file path name, which can include existing resource strings.

```
@LOAD "applications/data/scenario.dat"
```

5.1.5 Manipulating Resource Files

The user can manipulate existing list resources by using the special operators, @APPEND, @JOIN, @REMOVE and @MERGE. The operators respectively append a new item to a list (the item itself can be a list), join two lists together, remove an item from a list, merge an item into a list (a simple pattern match is employed to match the contents of the remove/merge property to the first matching element in the list). Examples of their use are given below:

```
TEST ( A B C )        Result  ( A B C )
@APPEND D                     ( A B C D )
@JOIN ( E F )                 ( A B C D E F )
@MERGE G                      ( A B C D E F G )
@MERGE A                      ( A B C D E F G )
@REMOVE D                     ( A B C E F G )
```

Note that any resource values can be overridden with new values simply by resetting the resource value.

5.1.6 Resource File Locations

The Edep platform resource files are located using the Java SDK resources mechanism. This Java mechanism allows resource filenames to be specified in a similar fashion to package Imports (i.e. simple pathnames independent of the filesystem).
For example, packaged within the Edep delivery, under the `<Edep Home>/ATC/src/atcapp` directory are a number of example resource files. As far as the SDK resource loader is concerned the path of such files is "`atcapp`/".
More specifically, the SDK with search through all directories and jar files listed within the CLASSPATH variable in order to locate a resource file.

When using IDE tools such as Jbuilder and Eclipse the source (.Java) code is kept separate from the compiled (.class) code. Obviously, when running applications the CLASSPATH refers to the classes directory and not the source directory. Therefore these IDE tools will automatically copy all resource files[1] into this classes directory before running.

5.1.7 Reserved Resource Names

The resources file also defines a small number of reserved resource names, as indicated in the table below.

Resource Name	Description
LOGICAL_COLOURS	User defined list of named colours mapped to an item name.
PHYSICAL_COLOURS	User defined list of RGB values identifying physical colours.
FONTS	User defined list of font name strings.

5.1.8 Scoped Resource Names & Overloading

Resources names can be complex, build up from 'dot' separated words. For example,

[1] Eclipse will treat all non Java files as resources – hence they will be copied. JBuilder has to be to be configured via the properties option to copy certain file types.

```
GSDK.MIDDLEWARE.OPTIMISE_COLLOCATION FALSE
CWP1.GSDK.MIDDLEWARE.OPTIMISE_COLLOCATION TRUE
```

The first element of the scoped resource is invariably the component name. This is often used to provide a form of resource overloading. That is, when looking up a resource value "`x.y`", the platform will first attempt to locate a resource named "`<component>.x.y`" followed by "`x.y`". This obviously allows resource values to be set in a general fashion and then overloaded for a particular component.

5.1.9 System Start up

During application launch, the Edep platform will automatically attempt to load a file `atcapp/resources/defaults.gsdk`. This file is intended to contain system-wide defaults that apply to all applications.
The developer may also cause the platform to load a specific resource file. This is done via the command line option *–r <resource file name>*.

5.2 COMMAND LINE ARGUMENTS

The following command line arguments are recognised by Edep:

ARGUMENT	PURPOSE
-r <resource file>	Specifies the resource file to be loaded at start-up
-p <resource name> <resource value>	Allows specific resource values to be explicitly set via the command line

5.3 RESOURCE LIST

This section lists the resources currently available to the developer for tailoring the Edep platform behaviour.

5.3.1.1 General Resources

Resource	Description	Default
COMPONENTS	The list of components to be instantiated within the VM. This list contains elements of the form (component-class component-name). For example, COMPONENTS((atc.ts.TS TS))	
<c>.DEBUG_APP<c>	Boolean flag indicating if Debug is active within the context of the given component's thread.	FALSE
DEBUG_UNKNOWN	Boolean flag indicating if debug is active within the context of unknown threads (e.g. RMI threads).	FALSE
DEBUG	Global flag for disabling debug everywhere when set to false.	FALSE
WARNING	Boolean flag defining if warning messages should be output.	TRUE
MESSAGE	Boolean flag defining if info messages should be output.	TRUE
<component>.SCENARIO	The Entity scenario file used to populate the components database on startup.	N/a
<component>.DYNAMIC_SCENARIO	The monitored dynamic scenario directory	N/a
<component>.DYNAMIC_SCENARIO_UPDATE	The default speed for polling of the monitored scenario directory, in milliseconds.	1000

5.3.1.2 Recording and Replay resources

The following resources are available for recording and replay. Refer to section 0 for more information.
Note: in the current release of the Edep platform these resource options are normally associated with CWP components.

Resource	Description	Default
<component>.RECORD_MODE	Value is either RECORD, REPLAY or NONE	NONE
<component>.RECORD_FILE	When RECORDing this value defines a filename into which all network messages are recorded. For example, /edep/src/atcapp/recording/cwp1.log" When REPLAYing this value a Java resource from which replay data is retrieved. For example, "atcapp/recording/cwp1.log"	
<component>.ORDER_RECORD_FILE	Only used in RECORDing mode. Defines the file into which all significant scenario events (e.g. controller orders) are recorded. For example, "/ATC/src/atcapp/recording/cwp1_orders.log"	
REPLAY.ORDER_RECORD_INDEX	Only used in REPLAY mode. Defines a Java resource file which itself lists all of the individual order record files to load	
GSDK.RECORDING.STREAM_RESET_INTERVAL	The number of events to write to the output stream between each call to reset() (to avoid memory leaking).	100

5.3.1.3 Middleware Resources

Resource	Description	Default
GSDK.MIDDLEWARE.DISCOVERY_DEFAULT_TIMEOUT	Defines the time in seconds that the discovery service will wait before abandoning a lookup.	
GSDK.MIDDLEWARE.DISCOVERY_HOST	The hostname of the machine running the Edep discovery service (contained within the simulation Engine)	
GSDK.MIDDLEWARE.DISCOVERY_PORT	The port used by the RMI registry (found within the discovery service)	1099
GSDK.MIDDLEWARE.EVENT_DISPATCHING_THREADPOOL_SIZE	Thread Pool size for multi threaded event dispatching	5
GSDK.MIDDLEWARE.MULTITHREAD_EVENT_DISPATCHING	Determines if an event can be distributed to several clients in parallel	FALSE
GSDK.MIDDLEWARE.OPTIMISE_COLLOCATION	If active, then the use of RMI is suspended between objects within the same VM (i.e. no serialization overhead)	TRUE
GSDK.MIDDLEWARE.OPTIMISE_EVENT_MARSHALLING	If set then events are pre-marshalled before being dispatched to clients. This is an important □ctioned□ion when the number of clients is large.	FALSE
GSDK.MIDDLEWARE.OPTIMISE_ONEWAY_CALLS	Provides a CORBA-like oneway semantic for remote methods which have a void return type.	FALSE
GSDK.MIDDLEWARE.USE_DISCOVERY_SERVER	Determines if the discovery server is to be started or not. This is usually set to false when running internet demos. If set to false, then OPTIMISE_COLLOCATION must be	TRUE

Resource	Description	Default
	TRUE.	

5.3.1.4 Graphics Resources

Resource	Description	Default
CURSOR_SIZE	1=Default cursor (mouse pointer) 2=more visible cursor, 3=larger, more visible cursor.	1
DEBUG.AWS.PATCH		
FONTS	Defines the list of fonts to use	
GSDK.AWS.OPTIMISE_REDRAW	Determines whether graphics optimisation should be used. Options are NONE and SINGLE_RECTANGLE	NONE
GSDK.AWS.UPDATE_THRESHOLD	Defines the maximum number of dirty redraw rectangles allowed before a full redraw is □ctioned	-1 (i.e. unlimited)
GSDK.AWS.USE_VOLATILE_IMAGES	Defines if J2SE 1.4 support for Volatile Images may be used	TRUE
GSDK.AWS.FULL_VOLATILE_IMAGES	Defines if Volatile Images are to be used throughout the graphics display. For use with non-transparent displays only.	FALSE
GSDK.AWS.MENU.VERTICAL_MARGIN and GSDK.AWS.MENU.HORIZONTAL_MARGIN	Defines a sensitive margin in pixels around a menu. It is used to trigger a menu destruction if the corresponding GSDK.AWS.MENU.DESTROY_ON_EXIT resource.	10 pixels and 10 pixels
GSDK.AWS.MENU.DESTROY_ON_EXIT	If set true, destroys menu when cursor is outside of bounding margin.	False
GSDK.AWS.MENU.DESTROY_ON_BUTTON 3	If true destroys menu on mouse button 3 press	True
GSDK.RANGERING.FREQ	The frequency at which range rings are drawn.	5
GSDK.REGION.LANE.AIRLANE_WIDTH	Airlane width in Nautical Miles. This is only used when running in non-transparent mode. N.b. 1Nm = 1852 metres.	18520
GSDK.SWING_GRAPHICS_UPDATE_RATE	Time in milliseconds between each redraw check	20
GSDK.REPORT.HANDLERS	A list of report handler classes. The report handler objects shall be generated from this list.	Empty list
GSDK.REPORT.LOGFILE	The name of the reporter log file to be used with the FileReportHandler object.	“edep_log”
GSDK.REPORT.TIMESTAMP	The time stamp to append to the log file.	False
GSDK.REPORT.TIMFORMAT	The format of the time in the time stamp using the Java SimpleDateFormat class.	hh.mm.ss_ddMMMyyyy
GSDK.AWS.ZOOM_TO_MOUSE	Zoom control using mouse wheel.	TRUE
GSDK.AWS.USE_CENTRE_BUTTON_PAN	Pan control using mouse centre button	TRUE
GSDK.AWS.PAN_SCALE_FACTOR	Pan scale factor	4
GSDK.MAXIMUM_TRAIL_HISTORY	Length of trail history	15
GSDK.EXTENDED_RANGE_AND_BEARIN G	Extended range and bearing tool showing range and bearing readout at both ends of the line.	FALSE
GSDK.SPEED_FILTER_LOWER_BOUND	Lower range value for speed filter	0
GSDK.SPEED_FILTER_UPPER_BOUND	Upper range value for speed filter	100
GSDK.NUMBER_OF_SPEED_VECTOR_BUT TONS	Number of speed vector buttons in extended radar toolbox	5
GSDK.SPEED_VECTOR_BUTTONS	Speed vector button label values in the form of a list.	None
GSDK.NUMBER_OF_TRACK_HISTORY_BU TTONS	Number of track history buttons	5
GSDK.TRACK_HISTORY_BUTTONS	Track history button label values in the form of a list	None
IMAGES	Directory where application images are kept.	Atcapp/resources/images
LABEL.DEBUG	Used by several graphical applications to display extra debug information in graphical labels	FALSE
LOGICAL_COLOURS	Defines the list of logical colours.	
PHYSICAL_COLOURS	Defines the list of physical colours.	
TRANSPARENCY	Boolean flag determining if overlay transparencies are to be used	FALSE
PVD.NORMAL_COLOUR.FILL_SOLID	Fills polygons with solid colour in non-transparent mode. Can be used to give impression of transparent colour.	FALSE
PVD.RTB.EXTENDED_RADAR_TOOLBOX	Increased number of trail history buttons in radar tool box	FALSE
RADAR_TOOLBOX.HEIGHT_FILTER.LOW ER	Lower range for the height filter	0
RADAR_TOOLBOX.HEIGHT_FILTER.UPPE R	Upper range for the height filter	600
SCREENMANAGER	Defines the Screenmanager to be used – this will be replaced by the PLUGIN.CWP_SCREEN_MANAGER individual managers in future.	
PLUGIN.CWP_SCREEN_MANAGER	Defines the screenmanager Plugins components to be used. These are defined in interface / implementation pairs.	PpdManagerImpl PvdManagerImpl VawManagerImpl EATMPFlightLegManag er & AsasManagerImpl

5.3.1.5 General ATC resources

Resource	Description	Default
HANDOVER.STD, COORDINATION.STD	Defines the co-ordination state machine.	
CPDLCACM.STD, CPDLCALC.STD	Defines the datalink state machines.	
ATC.LAST_VALID_LOWER_FLIGHT_LEVEL		
ATC.RVSM	Determines if RVSM separations are to be used	true
CLOCK.STARTTIME	Defines the clock start time within a quoted string. The value can be of the form “HH:MM:SS” or “dd/MM/yy@HH:mm:ss”	00:00:00
CLOCK.STOPTIME	Defines the time at which the platform should shutdown. If no value is specified, the platform will continue to run ad infinitum.	None.
CLOCK. SYNCHRONIZED_TO_UTC	When set to true the simulation start time is set to the system time and the simulation is started as soon as the TS component is started. The play, pause and fast-forward buttons on the console are disabled when in this mode. If the CLOCK.SYNCHRONIZED_TO_UTC resource is set to true, the CLOCK.STARTTIME is ignored.	False
PROJECTION.CENTRE.LATITUDE PROJECTION.CENTRE.LONGITUDE	Defines the centre of projection (in degrees) for the application. The values are simple floating-point numbers. Note: this value should be identical for all components forming part of the same Edep application.	52.0 0.0
PROJECTOR.CLASS	The coordinate conversion algorithm.	Gsdk.geometry .Lambert
CONSTRAINT.CLASS	Defines the implementation class for the Constraint interface. The default value is gsdk.trajectory.ConstraintImpl	
TRAJECTORY.CLASS	Defines the implementation class for the Trajectory interface. The default value is gsdk.trajectory.TrajectoryImpl	
WAYPOINT.CLASS	Defines the implementation class for the Waypoint interface. The default value is gsdk.trajectory.WaypointImpl	

5.3.1.6 Core ATC Component Resources

Resource	Description	Default
ACSG Component		
CONNECTED	Sets the TCAS source to ACAS server if true, scripted if false.	FALSE
The following resources are only required when CONNECTED=TRUE		
ACS_PORT_MTRK	The port on which to send to the ACS for MTRK messages.	8010
ACS_PORT_NOTIF	The port on which to send to the ACS for NOTIF messages.	8001
LOCAL_PORT	The port on the local machine to listen to for ACS Ras messages.	8011
The following resources are only required when CONNECTED=FALSE		
SCENARIO_READER	The Scenario Reader for TCAS Entities. (eg. Atcx.acsg.server.ACSGScenarioReaderImpl)	
SCENARIO	The TCAS Script.	
DATALINK_UPDATE_INTERVAL	The frequency, in seconds, at which TCAS advisories should be reported in Datalink mode.	1.0
ADSB Component		
REPORT_CAT21	Sets debug report messages for CAT21 messages	FALSE
UDP.FORWARDING_CAT21_CONNECTIONS	Defines the external UDP channels to forward ADSB Category 21 messages to.	
UDP.FORWARDING_CAT21	Enables forwarding of ASTERIX Category 21 messages via UDP.	FALSE
UDP.FORWARDING_CAT21_DEBUG	Sets forwarding debug output for UDP forwarding of Category 21 Asterix Messages.	FALSE
UDP.FORWARDING_CAT244_CONNECTIONS	Defines the names of the external UDP channels to forward ADSB Category 244 messages to. Note: These channels must be defined in SMART.UDP.CONNECTIONS resource.	
UDP.FORWARDING_CAT244	Enables forwarding of ASTERIX Category 244 messages via UDP.	FALSE
UDP.FORWARDING_CAT244_DEBUG	Sets forwarding debug output for UDP forwarding of Category 244 Asterix Messages.	FALSE
SMART.UDP.CONNECTIONS	The set of UDP connections from Edep/ADSB to SMART. Also connections to external clients.	
SMART.UDP.ENABLED	The SMART UDP connection is enabled.	FALSE
UDP.MESSAGE_TYPE	The Java class defining the type of message (always Asterix)	
UDP.READ_SIZE	Maximum UDP message size in bytes	4096
STORE_HISTORY	The ADSB reports are stored in the ADSBHistory object if this is set, otherwise only one report is stored.	FALSE
BUFFER_INTERVAL	Rate at which incoming UDP ADSB messages are distributed.	1 (second)
Coordination Component		
COORDINATION.ACTIVATION_TIME	Time, in seconds, from unit entry at which inbound is signalled to the next unit	600.0
COORDINATION.AUTOMATIC_ACCEPTANCE	Determines whether coordination requests should be automatically accepted.	FALSE
COORDINATION.AUTOMATIC_HANDOVER	Defines if all handovers should be automatically initiated and accepted (ideal for demonstration modes)	FALSE
COORDINATION.AUTOMATIC_RESPONSE_DELAY	Time delay between a request and the response from an unmanned unit	20.0
COORDINATION.RELEASE_DELAY	Time, in seconds, from unit entry at which release is signalled to the next unit	60.0
COORDINATION.STD HANDOVER.STD	Defines the co-ordination state machines.	
COORDINATION.ACTIVATE_ON_XFL	Determines how a flight's XFL is set before an activate message has been sent to the next sector. If true, an activate message is automatically sent, and the XFL is set by coordinating with the next sector. If false, the XFL is set without any coordination.	TRUE

AIRSPACE Component		
ASP.SCENARIO	Defines the resource file containing the airspace definition. The resource path is relative (e.g. atcapp/resources/airspace1.dat)	
ASP.SCENARIO_READER	Defines which parser framework is to be used to read in the scenario data. The value is normally "gsdk.scenario.ScenarioReaderImpl"	
ASP.MIDDLE_MARKER_POSITION	The position, relative to an ILS Ladder at which the dotted lockon box is drawn, for example a value of 6 means the dotted lockon box is drawn on the 6th rung of the ladder, counting away from the runway.	8 Nm
ASP.OUTER_MARKER_POSITION	The length of the area (Nm) in which an aircraft can lockon, defines the dotted box at the start of an ILS Ladder.	13Nm
ASP.LOCKON_WIDTH	The width of the area (Nm) in which an aircraft can lockon, defines the dotted box at the start of an ILS Ladder.	1Nm
ASP.LOCKON_HEIGHT	The maximum height (ft) an aircraft can lockon at.	3000ft
ASP.REDUCE_SPEED_DISTANCE	The distance from the runway that the aircraft should reduce speed in Nm.	4Nm
ASP.FINAL_APPROACH_SPEED	Returns the final approach speed for a B744 in knots	150Knots
ACR (Performance) Component		
ACR.SCENARIO_READER	Defines which parser framework is to be used to read in the aircraft performance data. If the program is reading BADA data with online conversion, this should be "atc.performance.server.BadaScenarioReaderImpl", otherwise "gsdk.scenario.ScenarioReaderImpl"	
ACR.SCENARIO	Defines the file holding the aircraft performance data. If the program is reading BADA data with online conversion, this should be the types.dat file at the root of the BADA directory; otherwise, this should be the Edep-formatted aircrafttypes.dat file.	
ACR. USE_OPERATIONAL_VALUES	override the turn radius rate values to give constant turn rate for all altitudes.	FALSE
ARTAS		
ARTAS.<StreamID>.DEBUG_REPORT_CAT62	Sets debug report messages for CAT62 messages	FALSE
ARTAS.<StreamID>.DEBUG_REPORT_CAT32	Sets debug report messages for CAT32 messages	FALSE
ARTAS.<StreamID>.DEBUG_REPORT_CAT21	Sets debug report messages for CAT21 messages	FALSE
UDP.ENABLED	Set to true if UDP connections are required, including host channel name, host name port.	FALSE
ARTAS.<StreamID>.FILTER_ON_ARTAS_UNITS	Defines whether ARTAS unit should be used to filter messages.	
CONNECTIONS	Defines the set of UDP connections required.	
UDP.READ_SIZE	Maximum size of UDP message in bytes.	4096
CWP.RECEIVE_UNITS	Units to receive data from Artas for.	
UDP.MESSAGE_TYPE	The Java class defining the type of message (always Asterix)	
ARTAS.<StreamID>.DSID_SIC	The default data source identifier.	
ARTAS.<StreamID>.DSID_SAC	The default data source area.	
ARTAS.<StreamID>.USER_NUMBER	The user number enrichment data.	0
ARTAS.<StreamID>.CENTRE	The track source centre enrichment data.	0
ARTAS.<StreamID>.POSITION	The track source position enrichment data.	0
IAS.GENERATE_ENRICHMENT_REPORT	Enriches track data with ARTAS sourced data	FALSE
IAS.ENRICH_EVERY_REPORT	Enrich every track with the additional ARTAS data.	FALSE
ARTAS.STATE_VECTOR_DEBUG	Debug information for state vectors.	FALSE
ARTAS.MISSED_TRACK_STALEOUT	The number of tracks to miss before a track is staled out.	1
ARTAS.UPDATE_RATE	The speed that artas updates each track. (used to calculate stale out time).	5
ASTERIX MESSAGES		
ASTERIX.FIX_FSPEC_LENGTH	If set, Asterix message compound fields FSPEC fields are set to a fixed maximum length. See atc.asterixmessages.fields.compound.AbstractCompoundField.	false

DL (Datalink) Component		
DL.ACL_TIMEOUT	The maximum time, in seconds, allowed for an ACL dialogue before it is deemed to have timed out.	15
DL.ACL_AUTOMATIC_RESPONSE_DELAY	The delay before the Datalink server will auto-respond to an Clearance request when no PWP is present.	10
DL.ACM_AUTOMATIC_RESPONSE_DELAY	The delay before the Datalink server will auto-respond to a Handover request when no PWP is present.	10
IFPL Component		
<IFPL>.ACTIVATION_DELTA	Defines the activation delta time in seconds. Flight Plans will be sent out this number of seconds before their official activation time.	0.0
<IFPL>.FORCE_IMMEDIATE_ACTIVATION	If set to TRUE then all IFPLs are activated immediately at start up. This is useful for data preparation needs	FALSE
<IFPL>.SCENARIO	Defines the resource file containing the airspace definition. The resource path is relative (e.g. atcapp/resources/airspace1.dat)	
<IFPL>.SCENARIO_READER	Defines which parser framework is to be used to read in the scenario data. The value is normally "gsdk.scenario.ScenarioReaderImpl"	
IFPL.START_TRAJECTORY_ID	The trajectory ID is an incrementing field stored in the flightplan. It is set in flightplan order starting from this value. It is used for PMs generation ADSBReports.	1000
STCA Component		
<STCA>.COVERAGE_ZONE.LAT1 <STCA>.COVERAGE_ZONE.LONG1 <STCA>.COVERAGE_ZONE.LAT2 <STCA>.COVERAGE_ZONE.LONG2	Defines the lat/long rectangle for which safety nets are required.	
<STCA>.LOOKAHEAD_TIME	The look ahead time in seconds	120.0
<STCA>.SEPARATION_THRESHOLD	The horizontal separation threshold in nautical miles	5.0
<STCA>.UPDATE_INTERVAL	The update interval in seconds	5
VERTICAL_SEPARATION.NON_LEVEL_SUPPLEMENT		0
<STCA>.SMOOTHING DELAY	The STCA smoothing delay in milliseconds. The STCA calculation algorithm can be delayed before updating: this helps to smooth out overall system loading.	2000
<STCA>.FILTER_ON_CFL	Flag used to select filtering of STCA according to expected CFL stop-off level.	False
<STCA>.MAX_POSSIBLE_SPEED	The maximum possible aircraft speed in metres/second. This value determines the size of the STCA grid.	350.0
<STCA>.GENERATE_APW	When set Area Proximity Warnings are generated and shown in the CWP aircraft label and alert window. An area proximity warning is generated when a flight enters a restricted area.	False
<STCA>.APW_LOOKAHEAD_TIME	The number of seconds ahead of a flight entering a military sector that an Area Proximity Warning will be generated.	90
<STCA>.TRACK_PAIR_FILTERS	A list of classes that represent filters to be applied to pairs of tracks to determine whether or not they should be included in the STCA calculation. e.g. `STCA.TRACK_PAIR_FILTERS ("atc.stca.server.filters.MilitaryPairFilter", "atc.stca.server.filters.SameSourceFilter")` These filters reject tracks that are both military or which are not derived from the same source.	The pair of classes in the example on the left are used as defaults.

<STCA>.USE_TRACK_SOURCES	A list of strings that reference the Track sources that are to be monitored by the STCA calculation. Normally a Track created within the platform is has the source name "DEFAULT".	("DEFAULT")
MTCD Component		
<MTCD>.LOOKAHEAD_TIME	The look ahead time in seconds for which conflicts should be detected	1200.0
<MTCD>.SEPARATION_THRESHOLD	The horizontal separation threshold in nautical miles	5.0
<MTCD>.CONTEXTUAL_SEPARATION_THRESHOLD	The horizontal separation threshold in Nautical Miles beneath which an aircraft is deemed 'Contextual' for the subject aircraft.	15.0
<MTCD>.UPDATE_INTERVAL	The update interval in seconds between MTCD calculations	5.0
<MTCD>AREA_OF_INTEREST	The MTCD.AREA_OF_INTEREST resource defines an area ***around*** a unit. Any conflict that occurs in this area will be registered as being in the "area of interest" of the unit. The area is defined as a double representing a time, in seconds and is calculated for each flight from its speed (it will therefore vary from flight to flight.	0, no areas of interest are assigned.
<MTCD>.RISK_UPPER_VERTICAL_SEPARATION_THRESHOLD	The number of levels (100's of feet) added to the standard vertical separation (upper non-RVSM airspace) in order to detect aircraft that may potentially be a risk if the aircraft changes the CFL to the RFL or XFL. (Requires MTCD.USE_EXTENDED_RISK)	30
<MTCD>.RISK_LOWER_VERTICAL_SEPARATION_THRESHOLD	As previous entry but in lower or RVSM airspace.	30
<MTCD>.USE_EXTENDED_RISK	Determines whether the MTCD should generate Conflict Risk in an extended vertical separation. See previous two entries.	False
<MTCD>.USE_CONTEXTUAL	Determines whether the MTCD should detect Contextual conflicts. These are not real conflicts but flights that are present within an extended lateral separation and in a vertical zone containing the AFL,CFL, and XFL of the two aircraft (plus vertical separation margins). The contextual conflicts are often shown in the VAW as blue lines when displaying a subject aircraft's vertical trajectory. See MTCD. .CONTEXTUAL_SEPARATION_THRESHOLD	false
<MTCD>.INCLUDE_AIRSPACE_CONFLICTS	Flag indicating whether or not the MTCD component should report conflicts between aircraft and military sectors.	False
MTCD.MANUALPROBE_DISPLAY_TIME	The manual probe information display time in seconds.	3
MTCD.MANUALPROBE_LOOKAHEAD_TIME	The manual probe trajectory lookahead time in seconds for detecting a loss of separation.	1200
<MTCD>.CONFLICT_ID_DOWNTIME	The period of time in seconds that must elapse, once a conflict has been destroyed, before its ID can be assigned to a new conflict.	30.0
MTCD.FILTER.UNIT_EXIT_MARGIN	This is the period of time after an aircraft's expected exit from the subject unit for which new conflicts involving the aircraft are deemed to be of interest to the subject unit. The time period is given in seconds.	180.0
MTCD.USE_TIME_HORIZON	This flag indicates that the time interval between TOC/BOD manoeuvre completion and the loss of plan separation should be used in the evaluation of the risk status of a potential conflict. See time horizon definition below.	False
MTCD.TIME_HORIZON	This is the minimum interval between the end of a climb manoeuvre (TOC/BOD) and the start of a conflict (the point of loss of separation), beyond which a conflict is declared as CONTEXTUAL, not CONFLICT or RISK.	300.0
FM Component		
EARLY_CLIMB_ACROSS_MULTIPLE_POINTS	Causes climbs to be done as early as possible (even before	TRUE

	sector entry)	
PAC_DELAY		
INCLUDE_MILITARY	Determines whether the FM should generate trajectories for military flights. Setting this resource facilitates the display of military flights in the PVT and allows the user to manipulate military flight plans.	FALSE
XFL_MODEL	Selects the method required to determine the initial value of the XFL value on a sector boundary prior to activation. After activation the XFL may be negotiated between adjacent units. The available methods are: TOCBOD, EDEP, LOA.	TOCBOD
FM.XFL_MODEL.TOCBOD.TOLERANCE	The altitude tolerance to use for deciding if an XFL should be set to the sector crossing altitude or the nearest TOD/BOD/TOC/BOC when the preceding flag is set to TOCBOD.	2500
FM.DELETE_FLIGHT_ON_TRACK_DESTRUCTION	Determines whether the FM removes the corresponding flight from its database when it receives a track destruction message from the IAS.	FALSE
FM.RECALC_ON_LONG_DEV	Determines whether a flight's ground trajectory is recalculated when the flight deviates longitudinally from its trajectory.	TRUE
FM.RECALC_ON_VERTICAL_DEV	Determines whether a flight's ground trajectory is recalculated when the flight deviates vertically from its trajectory.	FALSE
ILS Component		
ILS.AUTOMATIC_LOCKON	Determines whether a flight should automatically *attempt* to lock-on to an ILS. Flight will start searching for an ILS immediately after it encounters the top of STAR.	FALSE
IAS Component		
IAS.RADAR_UPDATE_INTERVAL	The radar update interval in seconds	6.0
IAS.TRAJECTORY_TO_FLY	Value of GROUND, AIRCRAFT or LIVE. If set the AIRCRAFT then plots are derived from the AIR subsystem state vectors. If set to GROUND, then plots are derived from the GROUND trajectory If set to LIVE, plots are derived from State Vectors provided by the ARTAS component.	Aircraft
IAS.DAP_UPDATE_INTERVAL	The frequency, in seconds, at which DAP data is sent by the IAS.	IAS.RADAR_UPDATE_INTERVAL
IAS.GENERATE_DAP	Determines whether IAS shall generate DAP data.	TRUE
IAS.EVENT_DISPATCH_MECHANISM	The event dispatch mechanism, radar or datalink, used to distribute data from the IAS. This will affect the rate at which data is dispatched by the IAS and whether any delay is imposed upon the time taken to dispatch the data.	RADAR
RECEIVED_DAP_DEBUG	Debug output for DAP. ON, OFF or DEBUG	OFF
ADSB.PROJECT_DEPENDENT_DAP	Plugin DAP additional data.	
IAS.STATE_VECTOR_DEBUG	Debug information for state vectors	FALSE
PM Component		
PM.CONSTRAINT_MANAGER	The constraint manager used in the PM.	
PM.MINIMUM_STATE_VECTOR_INTERVAL	Interval in seconds between state vector updates	6.0
PM.TCAS_RA_DELAY	Delay in seconds between immediate TCAS messages and delayed TCAS messages.	6.0
PM.SQUAWK_IDENT_DURATION	The length of time in seconds for which an aircraft will send an SSR ident signal in response to a squawk ident order.	20.0
RESUME_ANGLE	The maximum angle at which a flight will resume navigation.	
EARLY_CLIMB_ACROSS_MULTIPLE_POINTS	THIS RESOURCE IS DEPRECATED.	FALSE
AUTOMATIC_SID_AND_STAR	Causes SID and STAR orders to be issued automatically, to follow the SID/STAR trajectory.	
MINIMUM_CAP_UPDATE_INTERVAL	The fastest rate at which CAP messages are sent.	
PWP.DEFAULTS	The default PWPs.	None
SET_TIME_FROM_TRACKS	Uses the time from track updates to set the local component clock.	
RECEIVED_STATE_VECTOR_DEBUG	Debug output when a state vector received.	
RECEIVED_ADSB_DEBUG	Debug output when receiving ADSB reports. ON, OFF or DEBUG	FALSE
GENERATE_ADSB_DEBUG	Debug output when generating ADSB reports. ON, OFF or DEBUG.	FALSE
GENERATE_ADSB	Sets whether PM generates ADSB reports.	FALSE
PM.PWP_DELAY_ORDERS	Whether or not orders generated from the PWP should be delay by the PM.	FALSE
PM.PWP_ORDERS.DELAY.MEAN	The average delay to be suffered in seconds.	0
PM.PWP_ORDERS.DELAY.SPREAD	The spread about the average delay. i.e. min delay = average – spread/2 and max delay = average+ spread/2 (in seconds)	0
PM.HCWP_DELAY_ORDERS	Whether or not orders generated from a HCWP should be delayed by	FALSE

	the PM.	
PM.HCWP_ORDERS.DELAY.MEAN	The average delay to be suffered in seconds.	0
PM.HCWP_ORDERS.DELAY.SPREAD	The spread about the average delay. i.e. min delay = average – spread/2 and max delay = average+ spread/2 (in seconds)	0
DAP_PROCESSOR.CLASS	Plugin implementation of DAPAdditionalProcessor to process Additional DAP information.	
DAP_GENERATOR.CLASS	Plugin implementation of DAPAdditionalGenerator to process Additional DAP information.	
PM.EXCLUDE_FIXES_BEHIND	Sets whether fixes which are behind a flights supposed direction of travel (as determined from its assigned route, rather than its actual direction of travel) are regarded as invalid with respect to direct to and resume own navigation orders. If they are invalid and this resource is set to TRUE these fixes will not appear in the order entry panel.	FALSE
PM..DAP.PILOT_PREFERENCES	True if a PilotPreferencesReport should be down-linked via ADS-B to the GROUND system (For ADS-B equipped aircraft).	FALSE
FPM Component		
FPM.CONFORMANCE_CHECKING	TRUE if the FPM should do conformance checking between pilot-selected values and the associated ATC clearance.	False
FPM.CONFORMANCE.ALERT_TIME.CONTROLLER_RESPONSE	After the pilot enters a value that differs from the ATC clearance, an alert will be raised after this elapsed time (seconds) unless the ATC controller modifies the clearance to be the same.	5
FPM.CONFORMANCE.ALERT_TIME. PILOT _RESPONSE	After the ATC controller issues a clearance, an alert will be raised if the pilot does not conform before this elapsed time.	20
TP Component		
<TP>.CRUISE_TIMESTEP	Time step for non-manoeuvring aircraft.	30.0
<TP>.MANOEUVRE_TIMESTEP	Time step for manoeuvring aircraft.	10.0
<TP>USE_IMMEDIATE_TURN	Specifies whether aircraft should turn immediately or gradually.	
<TP>MODEL_SMOOTH_ACCELERATION	Specifies whether aircraft should accelerate/decelerate smoothly or instantaneously.	FALSE
<TP>ACCELERATION	The rate at which the aircraft changes speed. This is only applicable if smooth acceleration is modelled.	1.0
<TP>ACCELERATION_PROCESSOR.CLASS	The name of the class that models acceleration.	
<TP>MODEL_TIME	Specifies whether aircraft should model time constraints or leave the nominal performance timings.	TRUE
<TP>SPEED.MAXIMUM_INCREASE	The maximum speed increase as a proportion of the nominal speed appropriate for the aircraft type.	0.15
<TP>SPEED.MAXIMUM_DECREASE	The maximum speed decrease as a proportion of the nominal speed appropriate for the aircraft type.	0.10
<TP>TIME_PROCESSOR.CLASS	The name of the class that models time constraint.	
<TP>.INSERT_TIME_CONSTRAINT_SPEEDS	Sets whether speed constraints should be inserted into the trajectory to indicate the required speed changes. To Be Agreed	FALSE
<TP>MODEL_SMOOTH_CLIMBS	Specifies whether aircraft should accelerate/decelerate smoothly or instantaneously.	FALSE
<TP>CLIMB_SMOOTHING_PROCESSOR.CLASS	The processor class that models smooth changes in climb rate.	1.0
<TP>SMOOTHING.TIME_IN_CLIMB	The time before TOC/BOD during which flight is climbing or descending.	15.0
<TP>SMOOTHING.TIME_ON_LEVEL	The time away from TOC/BOD where the flight should be level.	5.0
<TP>.SMOOTHING.ACCELERATION	Smoothing vertical acceleration rate in ms-2.	2.0
<TP>.SMOOTHING.AIRCRAFT_ONLY	Only generate the smoothed climb for the aircraft trajectory.	FALSE
<TP>.SMOOTHING.DEBUG	Produce debug output for all modified points in the profile.	FALSE
<TP>.SMOOTHING.WITHIN_PROFILE	Flag to restrict smoothjing changes to be within the existing vertical profile, as produced by the TP.	TRUE
<TP>.SMOOTHING.WAYPOINT_INTERVAL	The interval between the generated waypoints for the smoothed climb/descent.	1.0
<TP>ACCELERATION_PROCESSOR.CLASS	The name of the class that models acceleration.	
<TP>MODEL_WIND	The flag indicating whether wind is modelled.	FALSE
<TP>WIND_PROCESSOR.CLASS	The name of the class that models wind.	
<TP>USE_RATE_1	Flag to indicate whether the aircraft should fly rate 1 turns or use the default TP turn model.	FALSE
<TP>RATE_1	The angular rate at which the aircraft turns in degrees per	3 degrees/sec

	second.	
<TP>USE_RATE_1_CEILING	States that rate 1 will only apply below the limiting altitude ceiling (see RATE_1_CEILING).	FALSE
<TP>RATE_1_CEILING	The maximum altitude at which rate 1 applies. Above this level, the radius increases according tp	10,000.0 ft
<TP>CLIMB_SPEEDS	The default list of climb speeds to taper the speed in the initial climb below 10,000ft ((<level> <knots>)…).	
<TP>DESCENT_SPEEDS	The default list of descent speeds to taper the speed in the final descent below 10,000ft ((<level> <knots>)…).	
component.TP.SERVER	The name of the TP server that should be accessed by the local application's TrajectoryService.	TP
TISB Component		
DEBUG_REPORT_CAT62	Sets debug report messages for CAT62 messages	FALSE
FILTER_ON_SERVICE_VOLUMES	Defines whether service volume filtering is enabled	FALSE
SERVICE_VOLUMES	List of Service Volumes to use.	
UDP.FORWARDING_CAT62_CONNECTIONS	Defines the names of the external UDP channels to forward TISB Category 62 messages to. Note: These connections must be defined in the TISB.EXTERNAL.CONNECTIONS resource.	
UDP.FORWARDING_CAT62	Enables forwarding of ASTERIX Category 62 messages via UDP.	FALSE
UDP.FORWARDING_CAT62_DEBUG	Sets forwarding debug output for Asterix Category 62 UDP forwarding.	FALSE
EXTERNAL.CONNECTIONS	Defines UDP connections to external clients.	
<CALLSIGN>.CONNECTIONS	Defines UDP connections to local cockpits, identified by callsign.	
UDP.MESSAGE_TYPE	The Java class defining the type of message (always Asterix).	
UDP.READ_SIZE	Maximum size of UDP message in bytes.	4096
STORE_HISTORY	The TISB reports are stored in the TISBHistory object if this is set, otherwise only one report is stored.	FALSE
GENERATE_TRACK_REPORTS_DEBUG	Debug output for Track Reports	OFF
BUFFER_INTERVAL	Rate at which incoming UDP TISBMessages are distributed.	1 (second).
TS Component		
CLOCK.STOPTIME	The time at which the system shall shutdown. If not specified, the system runs indefinitely.	
USE_EXTERNAL_START_TIME	Allows the service to pick up start time from an external source rather than the Time Server itself. This is required for use with OASIS.	FALSE
UCWP Component		
<UCWP>.AUTOMATIC_RESPONSE_DELAY	The delay in seconds before automatically responding to an incoming co-ordination request	10.0
<UCWP>.UNIT	The unit for which the UCWP component is responsible. This resource must be positioned.	UNDECLARED_UNIT

5.3.1.7 CWP Resources

Resource	Description	Default
<cwp>.PVD.X Y WIDTH HEIGHT	Plan View Display dimensions	
<cwp>.PVD.SCALE, LATITUDE, LONGITUDE	PVD centre position and scale	
<cwp>.MAP <map URL> <cwp>.MAP ((<name>, <map URL>) , (…))	Defines the map file or files to be used. If this resource is a list, it will read each map defined as a (name, URL) pair in a sub-list.	
<cwp>. PVD.DISPLAY_ALL_FIXES	Defines whether all fixes are to be displayed or whether the fix definition controls their display in the PVD. If this is not supplied, all fixes will be displayed.	

Resource	Description	Default
<CWP>.CWP.HEADING_SELECTION	Defines the step interval for selecting headings "NORMAL" = 5 degree interval. "NATS" = 1 degree interval.	
PVD.BEACON.CLASS PVD.LABEL.CLASS PVD.LABEL_BEHAVIOUR.CLASS	Defines dynamically the classes to be used for label graphics and label behaviour.	
PVD.SYMBOL.CLASS PVD.SYMBOL_BEHAVIOUR.CLASS	Defines dynamically the classes to be used for aircraft symbol graphics and label behaviour.	
PVD.TRACKSYMBOL.CLASS PVD.TRACKLABEL.CLASS	Defines dynamically the classes to be used for Track label and symbol. If this resource is not set, no symbol class is used.	
PVD.SIL.CLASS PVD.SIL_BEHAVIOUR.CLASS	Defines dynamically the classes to be used for SIL graphics and behaviour.	
PVD.SIL.SHOW_COMMITTED_PEL	Change SIL display to show the committed PEL value only, not the currently negotiated value.	False
PVD.MESSAGE_WINDOW_BEHAVIOUR.CLASS	Defines dynamically the classes to be used for Message Window graphics and behaviour.	
PVD.FLIGHTLEG.LABEL.CLASS	Defines the label class for display on the Dynamic Flight Leg. Current choices are: atc.graphics.pvd.FlightLegLabel and atc.graphics.pvd.SequencedFlightLegLabel	atc.graphics.pvd.FlightLegLabel
PVD.FLIGHTLEG.WPT_MARKER.CLASS	The class of the marker on the FlightLeg	gsdk.aws.AwsMarker (in PVD), or null (in VAW)
PVD.FLIGHTLEG.WPT_MARKER.HIGHLIGHT_ON_ENTRY	Highlight a marker on the trajectory when entering it with the mouse.	False
PVD.FLIGHT_FILTER.CLASS	Defines the class that will be used as the filter object for this PVD.	atcgraphics.graphics.pvd.FlightFilterImpl
PVD.STCA.LIMIT_TIME	The maximum length of the STCA conflict line in seconds from current location. By default the complete line is drawn without limit.	0
PVD.STCA.LINE_PATTERN	STCA line dash pattern – drawn to highlight a truncated STCA line.	Solid line
PVD.STCA.LINE_WIDTH	STCA heading line width in pixels.	4
ACLABEL.EXIT_WAYPOINT_BUTTON.NO_EXIT_COP	String value to go into the Exit Waypoint button when no exit cop is found – only used when PVD.LABEL.EXIT_WAYPOINT_BUTTON.SHOW_LND_WHEN_NULL is set to true.	"Land"
ACLABEL.EXIT_WAYPOINT_BUTTON.SHOW_LAND_WHEN_NULL	Show exit waypoint button when no exit waypoint is found.	False
FLIGHTLEG.EDITOR.MAX_REJOIN_ANGLE	The angle that the trajectory editor will choose a waypoint further down-stream as a rejoin point because the turn angle to rejoin is deemed excessive.	45
FLIGHTLEG.USE_STATE_COLOUR	Use the state colour of the aircraft rather than the fixed SYSTEM colour for the GROUND trajectory	false
FLIGHTLEG.USE_NEW_VERSION	Use the new version of the FlightLeg (temporary during transition)	false
PVD.ELASTICVECTOR.SHOW_TIME_DIFF	True to show the time gained/lost resulting from an Elastic Vector modification (in addition to the heading/bearing information normally shown)	False
PVD.FILTER_CONFLICTS		true
PVD.HISTORY_LENGTH	Number of trail dots in the track history.	5

Resource	Description	Default
PVD.HEADING_LENGTH	Length of the heading vector.	60.0
PVD.STCA_ALERT_WINDOW_FILTER_CLASS	Class defining the STCA filter logic for the EATMP Alert Window. The class must implement SubscriberFilter.	Null
PVD.APW_ALERT_WINDOW_FILTER_CLASS	Class defining the APW filter logic for the EATMP Alert Window. The class must implement SubscriberFilter.	Null
PVD.APW_AIRCRAFT_ALERT_FILTER_CLASS	Class defining the APW filter logic for CWP AircraftImpl. The class must implement AircraftAlertFilter.	Null
PVD.STCA_AIRCRAFT_ALERT_FILTER_CLASS	Class defining the STCA filter logic for CWP AircraftImpl. The class must implement AircraftAlertFilter.	Null
RADAR_TOOLBOX.*value*.PRESENT	Where *value* is the name of a button in the atc.eatmp.toolbox.RadarToolboxButtonPanel. Set to False for the button to be omitted in the panel.	True
USE_SPEED_FILTER	Determines whether or not the speed filter should be included in the radar toolbox.	False
RADARTOOLBOX.FILTERMENU.CLASS	Defines the class that will be used to create the filter menu for the radar toolbox. If no class is provided there will be no accessible filter menu.	Null
ACLABEL.HANDOVERMENU.*value*.PRESENT	Where *value* is the name of a button in the atc.graphics.menus.HandoverMenu. Set to False for the button to be omitted in the menu.	True
<cwp>.UNIT <cwp>.ROLE	Defines the CWP position's unit name and role type	NO_DECLARED_ROLE NO_DECLARED_UNIT
<cwp>.HYBRID	Defines if the CWP is a hybrid (clearances are sent to both GRD and AIR subsystems)	FALSE
<cwp>.SIL	Defines a list of SIL windows. Each SIL window is defined by the following sublist (name, long_posn, latitude-posn, COP1, … COPn) Where COP is the Coordination Point Fix;	
<CWP>.ALERT_WINDOW.X, Y, PRESENT <CWP>.MESSAGE_IN.X , Y, PRESENT <CWP>.MESSAGE_OUT.X , Y , PRESENT <CWP>.GENERAL_TOOLBOX.X, Y , PRESENT <CWP>.METEO_WINDOW X, Y, PRESENT	These resources define the positions and presence of the PVD inner windows, i.e. the EATMP alert window, the message in/out windows, the general toolbox and the meteo window.	0,0, FALSE
PVD.ELASTICVECTOR.SHOW_TIME_DIFFERENCE	Specifies whether the elastic vector should show the time difference between the existing route and the heading.	
SIL.MERGE_RANGE	Defines the range (in metres) used to merge the SILs that are close together when the SILs are defined automatically (CWP default behaviour).	0
SIL.NO_ENTRIES	Maximum number of entries permitted in a SIL.	20
	Conflict and Risk Display (CRD) / Predicted Problem Display	
CRD.PRESENT	Determines whether the conflict and risk display should be shown.	False
CONFLICT_DELEGATION_TIME	The time before a conflict that it will be delegated to the TACTICAL controller…	300
CONFLICT_LOOKAHEAD_TIME	The time (in seconds) before a conflict that it will be shown in the aircraft label of the PVD displays.	300
PPD.VERTICAL_AXIS_OFFSET	The distance in pixels by which the vertical axis on the PPD is offset to the left of the origin (or more precisely to the left of the minimum value on the horizontal axis).	0
PPD.POTENTIAL_PROBLEM_SYMBOL_SIZE	The size of the problem symbol used to show potential (aircraft) problems in the PPD and on	15

Resource	Description	Default
	flight legs. The size is actually the width and height in pixels of the bounding square.	
PPD.AIRSPACE_PROBLEM_SYMBOL_SIZE	The size of the problem symbol used to show airspace problems in the PPD and on flight legs. The size is actually the width and height in pixels of the bounding square.	21
<cwp>.CRD.X and CRD.Y	Screen position of the CRD in pixels.	
<cwp>.CRD.WIDTH and CRD.HEIGHT	Width and height of the CRD in pixels.	
<cwp>.CRD.MIN_HORIZONTAL_AXIS <cwp>.CRD.MAX_HORIZONTAL_AXIS <cwp>.CRD.MAX_HORIZONTAL_MENU <cwp>.CRD.MIN_HORIZONTAL_MENU <cwp>.CRD.MAX_VERTICAL_MENU <cwp>.CRD.MIN_VERTICAL_MENU <cwp>.CRD.MIN_VERTICAL_AXIS <cwp>.CRD.MAX_TACTICAL_VERTICAL_AXIS <cwp>.CRD.MIN_VERTICAL_AXIS <cwp>.CRD.MAX_PLANNING_VERTICAL_AXIS	The range and size of the horizontal and vertical axes.	
CWP.SSR.MODEA_AFL_DISPLAY	String used to replace AFL in the aircraft label when the aircraft's transponder is operating in Mode A.	"---"
<cwp>.CRD.DISPLAY_REMINDER_LINE	Determines whether a draggable line is drawn across the width of the PPD from the reminder triangle (which is always displayed).	True
<cwp>.CRD.REMINDER_MINIMUM_TIME	The time in seconds on the y axis beneath which the reminder triangle cannot be dragged.	0
<cwp>.CRD.DISPLAY_DISTANCE_TENTHS	Determines whether the distance to closest approach is displayed to the nearest nautical mile or the nearest tenth of a nautical mile.	True
<cwp>.CRD.AIRCRAFT_CONFLICT.SYMBOL_AT_START	Determines whether aircraft conflict symbols are displayed on the PPD graph at the start time of the conflict, or at the time of closest approach.	True
<cwp>.SPEED_MENU.SHOW_TAS	Specifies whether the TAS speed option is shown in the speed menu.	True
CWP.CFL_DISPLAY_THRESHOLD	The number of *flight levels* by which CFL must differ from AFL for CFL to displayed, i.e. CFL displayed if and only if |CFL-AFL| > CFL_DISPLAY_THRESHOLD	0
	Vertical Assistance Window (VAW) or Vertical Profile Tool (VPT)	
VPT.PRESENT		
<cwp>.VPT.X and VPT.Y		
<cwp>.VPT.WIDTH and VPT.HEIGHT		
<cwp>.VPT.SHOW_SECTORS	Specifies whether the VPT shall display all the sectors flown through the subject unit or simply to display the whole unit.	True
<cwp>.VPT.TIME_TO_UNIT_ENTRY <cwp>.VPT.TIME_TO_UNIT_EXIT	Time interval displayed on the VAW before unit entry and after unit exit.	3 minutes 3 minutes
<cwp>.SHOW_GROUND_FLIGHTLEG	Specifies whether the ground trajectory is displayed in the VPt.	True
	Flight Path Monitor/Deviation Related	
<cwp>.LATERAL_THRESHOLD	The maximum permissible lateral deviation in Nautical Miles, before a deviation is reported.	1.5
<cwp>.LONGITUDINAL_THRESHOLD	The maximum permissible longitudinal deviation, in seconds, before a longitudinal deviation is reported.	10
<cwp>.VERTICAL_THRESHOLD	The maximum permissible vertical deviation, in feet, before a vertical deviation is reported.	300

Resource	Description	Default
<cwp>. VERTICAL_CLEARANCE_THRESHOLD	The maximum permissible vertical deviation from the cleared flight level, in flight levels, before a vertical clearance deviation is reported.	3
<cwp>.VERTICAL_CLEARANCE_LATENCY	The time allowed, in seconds, for a flight to respond to a new vertical clearance (by climbing or descending), before a vertical clearance deviation is reported.	30.0
CWP.DEVIATION_TEXT_FORMATTER. CLASS	Class to define the text displayed in the deviation button. The class must implement the interface `atc.fpm.entity.DeviationTextFormatter.`	atcgraphics.graphics. buttons. DeviationButton. LabelTextFormatter
<cwp>.DELEGATION_TIME	seconds	300
FLIGHTLEG.EDITOR.MAX_REJOIN_ANGLE	The angle that the trajectory editor will choose a waypoint further down-stream as a rejoin point because the turn angle to rejoin is deemed excessive.	45
FLIGHTLEG.USE_STATE_COLOUR	Use the state colour of the aircraft rather than the fixed SYSTEM colour for the GROUND trajectory	false
FLIGHTLEG.USE_NEW_VERSION	Use the new version of the FlightLeg (temporary during transition)	false
QNH.TRANSITION_LEVEL	Determines the flight level under which a leading '0' should be added to the flight level displays in labels, flight level menus, extended labels, etc..	40
PAC.TEXT.MESSAGES.CLASSNAME	The class used to define the PAC (PreparedClearance) messages in the CWp.	Atc.common.clearances . DefaultPreparedClearanceMessages
PAC.LEAD_TIME.INFO	The time (seconds) before the activation time of a PreparedClearance that the ATC Controller should see the PAC message in Line 4 of the aircraft label.	120
PAC.LEAD_TIME.ALERT	The time (seconds) before the activation time of a PreparedClearance that the ATC Controller should see the PAC message in Line 0 of the aircraft label.	60
CWP.USE_UNDECORATED_DIALOGS	If false, the PPD and VAW dialogs are each decorated with a platform specific window. If true, the look and feel of these dialogs is similar to that of the AWS windows.	False
<cwp>.CWP.CONFLICT.CLASS	Class to use in conflict symbol factory to create instances of the conflict symbol.	Atcgraphics.graphics.conflict.ConflictSymbol
<cwp>.PVD.PRESS_AND_HOLD_DELAY	The delay interval after which a mouse click is interpreted as a press and hold followed by a release. Use on exit waypoint for quick-look trajectory leg display.	500 milliseconds
<cwp>.CWP.ENABLE_UNACHIEVABLE_LEVELS	Allows any climb level to be input when set true. When set false, restricts inputs to achievable levels as defined by the aircraft performance.	true
<cwp>.PVD.TRAIL.MAXIMUM_SIZE <cwp>.PVD.TRAIL.MINIMUM_SIZE	Sets the maximum and minimum sizes of the trail dots. The size will automatically taper from the maximum to the minimum size.	10 Pixels Maximum 5 Pixels Minimum

For an exhaustive description of resources that affect the ***FlightLeg*** appearance, edition, graphical layers, and functionality, see Ref: 6.

5.3.1.8 PVT resources

Resource	Description	Default
<PVT>.SHOW_UNIT_CROSSING	Shows unit crossings superimposed on trajectory data	FALSE
<PVT>.PVD.SCALE, LATITUDE, LONGITUDE	PVD centre position and scale	
<PVT>.PVD.X Y WIDTH HEIGHT	PVD graphical dimensions	
<PVT>.VPT.X Y WIDTH HEIGHT	VPT graphical dimensions	
<PVT>.AIRSPACE_VISIBLE	Determines whether the airspace is visible.	false
<PVT>.FLIGHT_TAG	The trajectory to be displayed in the PVT, either aircraft or ground.	GROUND

5.3.1.9 PWP resources

Resource	Description	Default
<pwp>.FREQUENCY	List of frequencies allocated to this PWP	
PWP.DEFAULTS	List of PWP positions designated as default positions (managing all unallocated frequencies)	
<pwp>.PWP_WIDTH / PWP_HEIGHT	The PWP Dimensions	1280 / 1024
<pwp>.PVD.X Y	Plan View Display position	
<pwp>.PWP_PVD.WIDTH	The width of the PVD and the top left column. The PVD expands vertically to fill all available vertical space above the Datalink Panel. The width of the top right column, containing the Aircraft Strips and Details Panels, is the width of the PWP minus the PVD width.	500
<pwp>.PWP_DATALINK.HEIGHT	The height of the PWP Datalink Panel. The Datalink Panel width is linked to the width of the PVD. The PVD fills all remaining vertical space above the Datalink Panel.	100
<pwp>.PWP_DETAILS.HEIGHT	The height of the PWP Details Panel. The Details Panel width is the width of the PWP minus the width of the PVD. The PWP Aircraft Strips Panel fills all remaining vertical space above the Details Panel.	150
<pwp>.PWP_BOTTOM.HEIGHT	The height of the Order Entry and Data Entry panels. The panels above use all of the remaining space in the PWP.	300
<pwp>.PWP_ORDER_ENTRY.WIDTH	The width of the Order Entry panel. The Data Entry panel expands to fill the remaining width of the PWP.	640
<pwp>.PVD.SCALE, LATITUDE, LONGITUDE	PVD centre position and scale	
<pwp>.MAP	Defines the map file to be used	
PVD.BEACON.CLASS PVD.LABEL.CLASS PVD.LABEL_BEHAVIOUR.CLASS	Defines dynamically the classes to be used for label graphics and label behaviour.	
PVD.SYMBOL.CLASS PVD.SYMBOL_BEHAVIOUR.CLASS	Defines dynamically the classes to be used for aircraft symbol graphics and label behaviour.	
PWP.AUTOMATIC_WILCO	Determines whether the PWP will automatically wilco all incoming datalink messages.	
PWP.HEADING_SELECTION	all headings snapped to N degree intervals where N is specified in the resource	5
PWP.EXCLUDE_UNACHIEVABLE_TURNS	Affects Direct to orders and resume own navigation data entry panels. Beacons which would involve turns that are unachievable will be filtered from the list of available beacons.	FALSE
PWP.ROWS / PWP.COLS	The default number of rows./cols to be displayed in the left hand data entry panel. Modifying these parameters enables the user to increase the number of aircraft displayed in one page. The user cannot reduce the number of aircraft below the default values.	4 / 5
PWP.DIRECT_DATA_ENTRY1.ROWS	Specifically sets the number of rows in the right hand data entry panel for direct to order entry,	6
PWP.DIRECT_DATA_ENTRY1.COLUMNS	Specifically sets the number of columns in the right hand data entry panel for direct to order entry,	10
PWP.HEADING_DATA_ENTRY3.ROWS	Specifically sets the number of rows in the right hand data entry panel for own navigation heading entries,	6
PWP.HEADING_DATA_ENTRY3.COLUMNS	Specifically sets the number of columns in the right hand data entry panel for direct to order	10

<pwp>.SUPERVISOR	entry, Determines whether the PWP has a supervisory role. A supervisor PWP displays all aircraft.	FALSE

5.3.1.10 Eye Tracking Resources

Resource	Description	Default
EYE_TRACKER.STATIC_FILE_PATH	Path of the file to which static data are recorded.	
EYE_TRACKER.DYNAMIC_FILE_PATH	Path of the file to which dynamic data are recorded.	
<CWP>.PANEL_UPDATE_LISTENER_CLASS	The update listener which records the objects in the PVD.	
<CWP>.VAW.PANEL_CHANGE_LISTENER_CLASS	The change listener which records the panel events (resized, moved, shown).	

5.3.1.11 Datalink Resources

RESOURCE	DESCRIPTION	DEFAULT
DOVE.ACL_AUTOMATIC_RESPONSE_DELAY	Seconds. The duration of delay the delay imposed before an unmanned PWP replies to a ACL controller request.	10
DOVE.ACM_AUTOMATIC_RESPONSE_DELAY	Seconds. The duration of delay the delay imposed before an unmanned PWP replies to a controller ACM request.	COORD.AUTOMATIC_RESPONSE_DELAY / 2
PWP.AUTOMATIC_WILCO	Boolean. If true a PWP shall automatically acknowledge all controller clearances. This parameter is only applicable to manned PWPs.	false
PM.ACL_TIMEOUT	Seconds. The time after which a controller pilot dialogue is deemed to have timed out.	15
DATALINK.ENABLED TRUE	True if Datalink should be used in the simulation	False
DATALINK.AUTO_UPLINK.TRAJECTORY.COORDINATED	True if a coordinated trajectory should automatically be uplinked after being accepted.	False

5.3.1.12 ASAS Resources

ASAS has been implemented in the context of the SPD project, and is subject to modification in the future. See Ref: 5 for the latest description of the ASAS resources.

5.4 COLOURS & FONTS

The various colours and fonts, which may be positioned via the resources are too numerous to mention. The developer is invited to consult the Java code, or consult the standard configuration files available in `atcapp/resources/common`.

Airspace
Airport Font
Airport Colour

Airway
GSDK.REGION.LANE.AIRLANE_WIDTH

5.5 COLOUR PALETTES

The CWP employs two sets of colour mappings, logical colours and physical colours. The physical colours file maps a colour name onto an RGB value. The set of logical colours map the colours of individual widgets onto physical colours. Using this approach it is relatively simple to change the colour of a specific widget without affecting the colour of any other widgets.

5.6 TYPICAL RESOURCE FILE STRUCTURE

The eDEP delivery contains many examples of structured resource files. The developer is invited to examine the following,

- `atcapp/resources/acceptancetests/validation2002`
  Examples containing multiple CWPs, uCWPs, PWPs running in either mono-process or distributed modes
- `atcapp/resources/common & atcapp/resources/componenttests`

6 EDEP SCENARIO FILES

6.1 AIRSPACE FILE

The airspace file, read by the ASP component, defines the static components of a simulation.

6.1.1 Airport Syntax

The airport syntax is illustrated below. An airport entity shall comprise a unique name and a list of the runways at the airport.

```
AIRPORT KJFK 52.98  0.51
COMPRISING
  KJFK_R27
END
```

Keyword	Data description	Data type	Mandatory?
AIRPORT	Airport name	String	y
	Latitude / Longitude of reference point for this airport	double / double	y
COMPRISING	List of runways references		y

6.1.2 Agreement Syntax

The agreement syntax is illustrated below.

```
AGREEMENT AGREEMENT_1
FIX KIPPA
FIX FAMBO
COMPRISING
   FILTER
      ORIGIN EHAM
   RULES
      <  210 RESTRICTED_FL 210
      >= 210 RESTRICTED_FL RFL
   END
   FILTER
      ORIGIN LHHR
   RULES
      >  210 RESTRICTED_FL 210
      <= 210 RESTRICTED_FL RFL
   END
   FILTER
      ORIGIN KJFK
   RULES
      = 210 RESTRICTED_FL 220
      < 210 RESTRICTED_FL 180
      > 210 RESTRICTED_FL RFL
   END
   FILTER
      ORIGIN EGGW
   RULES
      <  210 OR  >  240 RESTRICTED_FL RFL
      >= 210 AND <= 240 RESTRICTED_FL 220
   END
   FILTER
   RULES
      RESTRICTED_FL 260
   END
END
```

Keyword		Data description	Data type	Mandatory?
AGREEMENT		Agreement Name	String	y
FIX		Fix name We can define n fixes for each agreement	String	y
COMPRISING		No data, just indicate the start of agreement element list		y
FILTER		No data just indicate the start of agreement element filter		y
These tags can all be preceeded the tag NOT	ORIGIN	Origin airport name (0-1 origin per filter)	String	n
	DESTINATION	Destination airport name (0-1 destination per filter)	String	n
	FIX	Fix name (0 to n fixes per filter)	String	n
	ROUTE	Route name (0 to n routes per filter)	String	n
	SID	SID name (0-1 sid per filter)	String	n
	STAR	STAR name (0-1 star per filter)	String	n
RULES		No data just indicate the start of rule list corresponding to the filter		y
		First operator	> < >= <= =	n
		First threshold (only when first operator is present)	int (flight level)	n
		Logical connector (only if second operator is present)	OR AND	
		Second operator (only if first operator is present)	> < >= <= =	n
		Second threshold (only if second threshold is present)	int (flight level)	n
RESTRICTED_FL		Restriction to be applied	RFL int (Flight level)	y
END		No data, just indicate the end of agreement element list		y

Each agreement is made of several (1-n) agreement elements. The agreement is structured as follows:

- Fixes (fixes on which the agreement applies)
- List of Agreement elements composed of
    - Filter (filter flights that should follow the rules)
    - Rules

The fixes is the list of fixes on which the agreement applies (from 1 to n). In this example the agreement applies on KIPPA and FAMBO.

The filter will determine if the flight should follow the associated rules. For example:

```
FILTER
   ORIGIN EHAM
```

means that all flight coming from EHAM airport satisfy the agreement.
Filter can be made on

ORIGIN	Any flight coming from this airport satisfies the agreement.
DESTINATION	Any flight going to this airport satisfies the agreement.
SID	Any flight using this SID satisfies the agreement.
STAR	Any flight using this STAR satisfies the agreement.
FIX	Any flight having this fix in its IFPL satisfies the agreement.
ROUTE	Any flight following a portion of this route (according to its IFPL) satisfies the agreement.

The keyword NOT can be used in the filter.
For example:

```
FILTER
   NOT ORIGIN EGGW
```

means that all flights that do not come from EGGW satisfy the agreement. It is exactly the same for all other entities used in the filter.

The rules should be interpreted as follow:

- One operator only
  OP1 threshold1 RESTRICTED_FL *value*
  if (RFL *OP1 threshold1*) then *value*
- Two operators:
  - *OP1 threshold1* AND *OP2 threshold2* RESTRICTED_FL *value*
    if (RFL *OP1 threshold1* && RFL *OP2 threshold2*) then *value*
  - *OP1 threshold1* OR *OP2 threshold2* RESTRICTED_FL *value*
    if (RFL *OP1 threshold1* || RFL *OP2 threshold2*) then *value*

6.1.3 Fix Syntax

The fix syntax starts with a compulsory name, and must specify the point's latitude and longitude co-ordinates. The fix syntax also comprises optional qualifying tokens The following provide valid examples of fix syntax.

```
FIX BEENO  53.211980   3.035031
FIX BLUFA  52.925274   3.153416 DISPLAY FALSE
FIX BOLIN  53.543487  -2.384787 WAYPOINT
FIX DANDI  55.335161   4.980592 VOR
FIX DENBY  53.518141  -1.934622 NDB
FIX DOGGA  53.385280   1.900694 TACAN
FIX DONNA  55.463380   5.113971 VOR_TAC DISPLAY TRUE
FIX ELDIN  53.153929   3.337044 VOR_DME DISPLAY FALSE
FIX FAMBO  54.233450   0.142549 WAYPOINT DISPLAY FALSE
```

Keyword	Data description	Data type	Mandatory?
FIX	Fix name	String	y
	Latitude / Longitude of this fix	double / double	y
	Type of point	NDB TACAN VOR VOR_DME VOR_TAC WAYPOINT *Default value for FixType is NAVAID (i.e. any of NDB, TACAN, VOR, VOR_DME or VOR_TAC)*	n
DISPLAY	Display on CWP?	TRUE FALSE	n

6.1.4 Hold Syntax

The hold is defined in the airspace scenario file using the following syntax:

```
HOLD H1                   // Hold name
   FIX F1                 // Reference fix
   BASE_LEG_DISTANCE 30.0 // Distance of the base leg of racetrack (in nm)
   NOMINAL_SPEED 250      // CAS Knots
   ORIENTATION 240        // Heading direction of base leg
   DIRECTION RIGHT        // Turn direction when entering hold
END
```

These hold semantics are compatible with the IPAS definition of a hold, see Ref. 4. Note that the size of the hold may be determined in terms of the time it takes to fly the length of the base leg, rather than a length in metres. However, the time is estimated by dividing the base leg flight distance by the nominal flight TAS speed (derived from the nominal current CAS).

6.1.5 LOA Syntax

The Letter Of Agreement syntax comprises the name of the LOA and the COP fix that it is based on, the entry and exit sectors, plus some additional optional parameters. The following provide typical examples of LOA syntax:

```
LOA PERNO COP PERNO ENTRY UR EXIT FS

LOA MTZ_2      COP   MTZ
       ENTRY *****
       EXIT  UR
       BI_DIRECTIONAL
       ACTIVATION_DELAY      300.0
       GREEN_LEVELS   ( 290 310 )
```

The parameters are as follows:

Keyword	Data description	Data type	Mandatory?
LOA	LOA name	String	y
COP	Name of COP Fix at which the LOA applies	String	y
ENTRY	Name of entry sector. Note the special string '*****' can be used to denote any sector.*	String	y
EXIT	Name of exit sector. Note the special string '*****' can be used to denote any sector.*	String	y
BI_DIRECTIONAL	If present, LOA applies in both directions (i.e. with entry and exit sectors reversed)	Keyword only	n
ACTIVATION_DELAY	Time before sector entry that flights using this LOA should be activated	float number of seconds	n
GREEN_LEVELS	List of 'green' flight levels at which coordinations are automatically accepted.	list of integers	n

*: These are mutually exclusive – at least one of the entry and exit sector names must be specified.

6.1.6 Restricted Area Syntax

Restricted areas are simply defined as 3 dimensional volumes, as the following example illustrates

```
RESTRICTED_AREA MIL1
REGION
  ALTITUDE 0 45000
  52.98   0.51
  52.98   0.81
  52.49   0.74
  52.37   -0.79
  52.68   -0.96
  53.23   -0.31
  53.35   0.24
  53.24   0.32
  53.12   0.32
END WFZ
```

6.1.7 Route Syntax

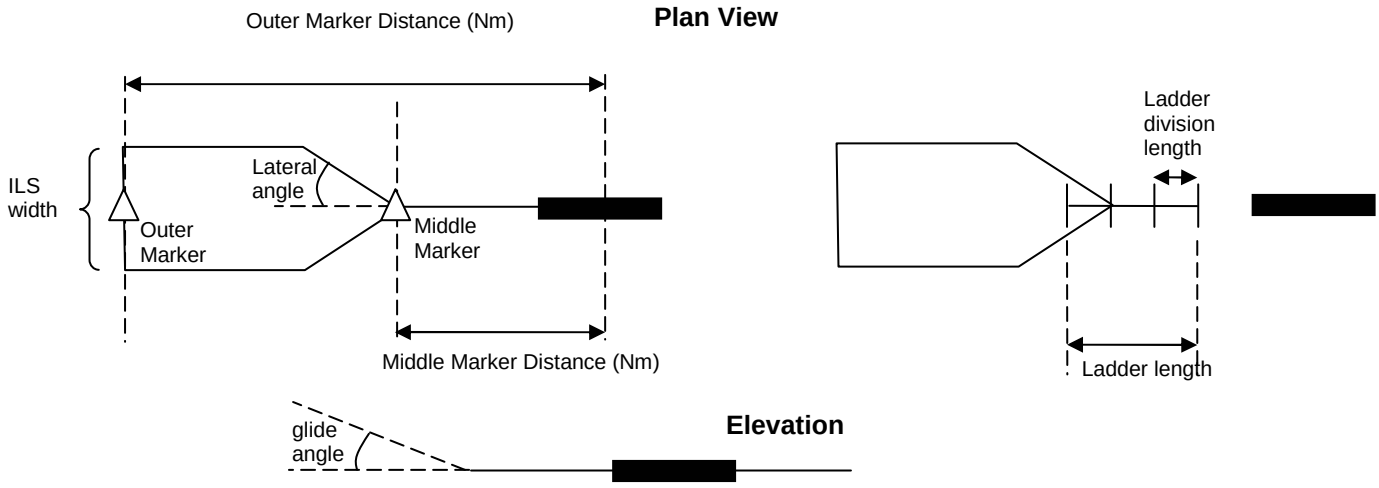
The route syntax comprises an optional SID followed by an en-route definition, and completed with an optional STAR.

```
ROUTE ROUTE_2
COMPRISING
  FIX DENBY
  FIX UPTON
  FIX GOLES
  FIX KIPPA
  FIX KOMIK
  FIX BLUFA
END
```

6.1.8 Runway Syntax

The runway syntax is illustrated below. A runway shall comprise a unique name that should identify the host airport and the runway name. Without the airport name component runway names would not be unique: it is quite possible that two airports would both have a runway R14L. The runway shall also comprise the latitude/longitudinal position, the runway length (in metres), the heading (in degrees). The runway shall also specify the current status, the threshold fix. Finally, the runway syntax allows the user to specify whether the runway is ILS equipped and if it is, the glide angle and the lateral angle.

```
RUNWAY LHHR_R14  52.98  0.51 1500 263 OPEN     THRESHOLD IOM
RUNWAY LHHR_R27  52.98  0.51 1500 263 OPEN_ILS THRESHOLD CLN ILS_EQUIPPED 3 30
RUNWAY EHAM_R19L 52.98  0.51 1000 263 CLOSED   THRESHOLD IOM
```



6.1.9 Sector Syntax

The following example illustrates the definition of an ATC Sector,

```
SECTOR NATS_S11
  REGION
```

```
    ALTITUDE 0 45000
    54.89   2.56
    53.54   1.81
    53.11   1.91
    52.03   0.55
    54.30   0.55
  END ATC
  ATC_CENTRE           NATS
  CONTROL_KIND         EN_ROUTE
  FREQUENCY            123.45
  COORDINATION_POINT SCORS
  COORDINATION_POINT SILVA
  COORDINATION_POINT DOGGA
  COORDINATION_POINT KIPPA
END
```

The following example illustrates a multi-volume sector definition

```
SECTOR NATS_S12B
  REGION
    ALTITUDE 0 45000
    53.27   1.81
    54.06   3.84
    51.75   3.74
    53.11   1.91
  AND
    ALTITUDE 0 45000
    53.50   0.55
    53.27   1.81
    53.11   1.91
    52.03   0.55
  END ATC
  ATC_CENTRE NATS
  CONTROL_KIND EN_ROUTE
  FREQUENCY 120.185
  COORDINATION_POINT DOGGA
  COORDINATION_POINT SCORS
  COORDINATION_POINT MONIL
END
```

The following table defines in more detail the data content

Keyword	Data description	Data type	Mandatory?
SECTOR	Sector name	String	y
REGION … END	Description of the volumes constituting this sector We can define the sector as a sum of volume using the AND keyword to group several REGION descriptions.		
	Type of zone	ATC…	y
ATC_CENTRE	Name of the ATC centre comprising this sector	String	y
CONTROL_KIND	Kind of control executed by this sector	EN_ROUTE APPROACH *If the value is not one of the previous, the control kind will be "UNKNOWN"* *This field is case sensitive*	y
FREQUENCY	VHF Frequency allocated to this sector	float	y
COORDINATION_POINT	Coordination point for this sector.	String (reference to a fix)	n

	We can define n coordination points per sector.		

6.1.10 SID Syntax

A SID is defined by identifying the name of the SID, and then creating a route made up from the departure runway name, and a sequence of SID points. These points mark out the path of the SID through the TMA region, together with a series of flight levels to be attained within the SID.

```
SID NCL_R6_1SP AIRPORT NCL RUNWAY NCL_R06
COMPRISING
   FIX NCL01 FLIGHT_LEVEL 020 CAS_SPEED 180
   FIX NCL02 FLIGHT_LEVEL 050 CAS_SPEED 210
   FIX NCL03 FLIGHT_LEVEL 070 CAS_SPEED 250
   FIX NCL11 FLIGHT_LEVEL 130
END
```

6.1.11 STAR Syntax

A STAR is defined by identifying the name of the STAR, and then creating a route made up from a sequence of STAR points, and the arrival runway name. These points mark out the path of the STAR through the TMA region, together with a series of flight levels to be attained within the STAR. The STAR may define

```
STAR EGGW_R1_1SP AIRPORT EGGW RUNWAY EGGW_R10
COMPRISING
  FIX EGGW07 FLIGHT_LEVEL 200 MACH_SPEED 0.75 PHASE INITIAL
  FIX EGGW06 FLIGHT_LEVEL 100 CAS_SPEED 250   PHASE INTERMEDIATE
  FIX EGGW05 FLIGHT_LEVEL  60                 PHASE FINAL
  FIX EGGW04 FLIGHT_LEVEL  20 CAS_SPEED 180   PHASE FINAL
END
```

Keyword	Data description	Data type	Mandatory?
STAR	Name	String	y
AIRPORT	Airport name	String	y
RUNWAY	Runway name	String	y
COMPRISING	No data, just indicates start of fix list		
FIX	Fix name	String	y
FLIGHT_LEVEL	Target flight level on this Fix	Integer	y
CAS_SPEED	CAS speed at fix.	Integer	n CAS_SPEED and MACH_SPEED are mutually exclusive.
MACH_SPEED	Mach speed at fix.	double	n, refer above.
PHASE	Approach phase	INITIAL INTERMEDIATE FINAL *If the value is not one of the previous, the approach phase will be "UNKNOWN"* *This field is case sensitive*	y

6.1.12 Unit Syntax

Sectors may be grouped into units (for control and coordination purposes). The following example demonstrates the file syntax,

```
UNIT UNIT_FEEDER
COMPRISING
  SECTOR FEEDER_1
  SECTOR FEEDER_2
END
```

6.2 TRAFFIC FILE

The traffic file, read and processed by the IFPL component, contains all the Initial Flight Plans of the simulation.

The eDEP supports two variants of IFPLs

- 2D + RFL
  the IFPL defines the route to be taken, and an RFL. The airspace AGREEMENTs are then used to dynamically determine the altitude profile.
- 3D
  the IFPL consists of a sequence of control points defining 2D and altitude values

6.2.1 Flight Plan Syntax

The IFPL is constructed from a number of separate elements, which resolve into a distinct constraint list, identifying the preferred route and profile of the flight.

An example civil flight plan is shown below.

```
FLIGHTPLAN     BAW2601
ACTIVATION     "13:05:00"
ORIGIN         KJFK
DESTINATION    EHAM
RFL            260
IFL            120
CFL            200
SSR_CODE       2304
SSR_MODE       C
ICAO_ADDRESS   12ed445
ETD            "12:52:00"
MODEL          B752
WAKE           HEAVY
WEIGHT         MEDIUM
CRUISE_CAS     480
TAIL_NUMBER    GBPEE
AIRLINE        Speedbird
ROUTE
       SID NCL_R6_1
       ROUTE_SEGMENT ROUTE ROUTE_4 FROM GOLES TO KIPPA
       CONTROL_POINT FIX SPRAT CAS_SPEED 400
       CONTROL_POINT FIX REDFA FLIGHT_LEVEL 290
       ROUTE_SEGMENT ROUTE ROUTE_8 FROM GABAD TO LOGAN
       STAR EGGW_R1_1
END
```

An example military flight plan is shown below.

```
FLIGHTPLAN "5200"
        ACTIVATION "16:02:40"
        ORIGIN LHHR
        DESTINATION EHAM
        RFL 310
        SSR_CODE 5200
        SSR_MODE C
       FLIGHT_TYPE MILITARY
        ETD "20:35:00"
        MODEL B744
        WAKE HEAVY
        TAIL_NUMBER MERGE1
        DATALINK Non_Equipped
        AIRLINE "Arctic Circle Air"
        ROUTE
                CONTROL_POINT FIX MULIT
                CONTROL_POINT FIX BACAL
                CONTROL_POINT FIX GARBT
        END
```

Keyword	Data description	Data type *& comments*	Mandatory?
FLIGHTPLAN	Callsign	String	y
ACTIVATION	Flight activation time	Time	y
ORIGIN	Departure airport name	String	y
DESTINATION	Destination airport name	String	y
RFL	Requested flight level	int	y
IFL	Initial flight level	int *To be added for milestone 2 (Mike)*	n If data is not given, the flight is considered to be stable at his CFL / RFL
CFL	Cleared flight level	int *To be added for milestone 2 (Mike)*	n If data is not given, the flight is considered to be stable at his RFL
SSR_CODE	SSR code	int (4 digits between 0 and 7)	y
SSR_MODE	SSR mode	A, B, C, D, S, NO *If a value is given and is not one of the previous, the mode will be "UNKNOWN"* *This field is case sensitive*	n If no value is given, we assume SSR mode is A (compliant with IPAS)
ALLOCATED_SSR_CODE	Allocated SSR Code	int (4 digits between 0 and 7)	n If no value is given, the ALLOCATED_ SSRCODE_ NOT_SET value is given (-1)
ICAO_ADDRESS	ICAO 24 bit address	String	n
FLIGHT_RULES	Flight Rules	String – INSTRUMENTED or VISUAL	n If no value is given, the RULES_NOT_SET value is used (-1)
FLIGHT_ TYPE	Flight TYPE	String – CIVIL or MILITARY	n If no value is given, the TYPE_NOT_ SET value is used and the flight is considered to be CIVIL
ETD	Estimated departure time	Time	y
MODEL	Aircraft model	String	y
WAKE	Wake turbulence category	LIGHT, MEDIUM, HEAVY *If the value is not one of the previous, the category will be "UNKNOWN"* *This field is case sensitive*	y

Keyword	Data description	Data type *& comments*	Mandatory?
CRUISE_CAS	Cruise speed (in knots)	int	y
DATALINK_STATUS	Whether aircraft is datalink equipped.	boolean	n
ASAS Capability	ASAS capability.		n
ADS-B Equipment	ADS-B equipment status.		n
RVSM_STATUS	Whether aircraft is RVSM equipped	boolean	n
TAIL_NUMBER	Tail number of the aircraft	String	y
AIRLINE	Airline name	String	n
ROUTE	Flight route	SID (optional) Sequence of CONTROL_POINT and / or ROUTE_SEGMENT STAR (optional)	y

6.2.2 Control Point Syntax

The control point syntax is essentially the same as that for points currently defined in the GSDK trajectory. The syntax starts with a compulsory name, and can describe the point as an explicit latitude or longitude, or can use the given fix name to retrieve a location. It can also define optional level and speed values, which will supersede any RFL or letters of agreement. The following provide valid examples of control point syntax.

```
CONTROL_POINT FIX SPRAT CAS_SPEED 400                    // SPRAT with speed
CONTROL_POINT FIX REDFA FLIGHT_LEVEL 290                 // REDFA with FL 290
CONTROL_POINT FIX DCS MACH_SPEED 0.9 FLIGHT_LEVEL 290    // DCS with speed and
altitude.
CONTROL_POINT 53.855928  -1.739048   FLIGHT_LEVEL 310    //Unnamed point
CONTROL_POINT FIX DSL                                    //DSL
```

There is no facility to implicitly create a new fix through a control point, i.e. the following syntax is invalid:

```
CONTROL_POINT BACON 53.855928  -1.739048
```

If a new fix point is required it should be explicitly created in the airspace file.

6.3 AIRCRAFT PERFORMANCE FILE

6.3.1 Methods of reading Aircraft Performance

There are three supported ways to obtain aircraft performance data – handcoded eDEP files, BADA files which are then converted into the required type online, and automatically generated eDEP files, which were converted from the BADA data using an offline tool.

To specify which of these to use, simply change the ACR.SCENARIO and ACR.SCENARIO_READER parameters in the resource – as specified below. Even if you believe that explicitly setting the ACR.SCENARIO_READER is unnecessary, it introduces potential risks of future clashes, and so it is always recommended to set the SCENARIO_READER whenever you change the ACR.SCENARIO.

6.3.2 Hand coded eDEP Files

In order to load using a basic eDEP file, include the following lines in the resource file:

```
ACR.SCENARIO “atcapp/resources/common/atc/acrtypes.dat”
ACR.SCENARIO_READER "gsdk.scenario.ScenarioReaderImpl"
```

The first line must specify the relative path of the file to be used; the server requires an input file detailing the performance characteristics of all known aircraft types.
The format is as follows

```
AIRCRAFT_TYPE B733
   NOMINAL_TURN_RADIUS      5000.4   // radius in metres
   TURN_RADIUS_RATE        0.65746   // radius change in metres/ft of altitude
   CAS_CRUISE                280.0   // in knots
   CAS_CLIMB                 280.0   // in knots
   CAS_CLIMB_RATE           4026.0   // in ft/min
   CAS_CLIMB_CEILING       42000.0   // in ft
   CAS_DESCENT               280.0   // in knots
   CAS_DESCENT_RATE        -1416.0   // in ft/min
   CAS_DESCENT_CEILING    -47200.0   // in ft
   MACH_CRUISE               0.74   // in Mach number
   MACH_CLIMB                0.76   // in Mach number
   MACH_CLIMB_RATE          3702.0   // in ft/min
   MACH_CLIMB_CEILING      42000.0   // in ft
   MACH_DESCENT              0.70   // in Mach number
   MACH_DESCENT_RATE         -334.0   // in ft/min
   MACH_DESCENT_CEILING    -4771.0   // in ft
   CLONES
      B732
      B734
      B735
      B73A
      B73B
   END
END
…
```

The following table summarises the fields,

Keyword	Data description	Data type *& comments*	Mandatory?
AIRCRAFT_TYPE	Aircraft type (as seen in IFPLs)	String	y
TURN_RADIUS_RATE		radius change in metres/ft of altitude	
NOMINAL_TURN_RADIUS	Turn radius	Radius in metres	y
CAS_CRUISE	Taken directly from BADA	knots	y

CAS_CLIMB	Taken directly from BADA	knots	y
CAS_CLIMB_RATE	BADA CAS Climb rate at sea level	feet/min	y
CAS_CLIMB_CEILING	BADA ceiling plus 15%	feet	y
CAS_DESCENT	Taken directly from BADA	knots	y
CAS_DESCENT_RATE	descent rate assumed same as B737 estimated from PTF data	Feet/min	y
CAS_DESCENT_CEILING	descent "ceiling" assumed same as B737 estimated from PTF data	feet	y
MACH_CRUISE	taken directly from BADA	knots	y
MACH _CLIMB	taken directly from BADA	knots	y
MACH _CLIMB_RATE	estimated from BADA PTF climb rate at CMTL and extrapolated back to ground level	feet/min	y
MACH _CLIMB_CEILING	taken from BADA ceiling plus 15%	feet	y
MACH _DESCENT	taken directly from BADA	knots	y
MACH _DESCENT_RATE	descent rate assumed same as B737 estimated from PTF data	Feet/min	y
MACH _DESCENT_CEILING	descent "ceiling" assumed same as B737 estimated from PTF data	feet	y
CLONES	Equivalent a/c types	String List	n

6.3.3 BADA Files (online conversion)

BADA files may be read, and converted computationally on startup. **This approach is discouraged due to the inherent performance hit.** In order to specify this, use the following lines:

```
ACR.SCENARIO            "bada/resources/data/types.dat"
ACR.SCENARIO_READER     "atc.performance.server.BadaScenarioReaderImpl"
```

The second line here specifies that the data is not to be read in directly, but loaded as BADA data, and converted online. This BADA data is a collection of over 250 files, each one specifying a subset of the data about each of around 100 aircraft. It is impractical to list each files in the resource; hence, the types.dat file must be introduced (and specified in ACR.SCENARIO).

Within the BADA directory, there are 3 subdirectories – apf, opf and ptf. Each subdirectory has the same naming convention – for each aircraft ICAO callsign (eg D228), there is a file inside the ptf directory called D228__.ptf. As such, to locate these files, all that is needed is a file listing each ICAO callsign currently used; this is types.dat. This must lie in the base bada directory, ie on the same level as ptf/, apf/ and opf/; and each token must be an existing ICAO type as described in each directory.

There is a performance issue related to online BADA conversion – while it has no impact during runtime, it may take a short time to calculate upon initialisation – typically in the region of 10 seconds.

6.3.4 BADA files (offline conversion)

In order to circumvent the performance issue, it is possible to convert the BADA files offline, and them read them in as an eDEP file format – the same format as used in section 6.3.2. To specify this, use the resource parameters:

```
ACR.SCENARIO            “atcapp/resources/common/atc/badatypes.dat”
ACR.SCENARIO_READER     "gsdk.scenario.ScenarioReaderImpl"
```

The file listed reflects the data in BADA v3.5, which is the data currently included with the project. As such, you should witness the same results as if you had used BADA files (online conversion). **This is the recommended approach**.

6.3.5 BADA offline converter

If a more up-to-date version of BADA is available, it is possible to convert the data, creating a new badatypes.dat file. In order to do this, run the file bada.offline.BadaOffLineConverter. The user will be prompted to locate two *.dat files. The first is the types.dat file for the new BADA data (as explained in section 6.3.3); specifying this wrongly will cause a program error, although you will be able to respecify and try again. The second is the target location to save – typing in the name of a nonexistant file will create this, and is recommended for this purpose. Once the new file is generated, simply specify it as the new ACR.SCENARIO field in the resource.

Note that often, BADA will change file format with each new release. The current reader is known to work for version 3.5, however future versions are not guaranteed to be compatible with either the BADA offline converter, or the BADA reader.

6.4 MAP FILE

6.4.1 Map definitions

The map details are stored in a single file, which defines the bounding latitude/longitude of the area from the South West corner to the North East corner. It then defines a sequence of coastline and contour polygons, with vertices given in floating point latitude/longitude co-ordinates. All positions are quoted in degrees.

The syntax of the map file allows a wide range of two-dimensional objects to be defined, by providing a generic syntax for area, linear and point features. Each item in the map is classed as AREA, LINEAR or POINT feature. By default, the feature is an AREA. Each item can define a height above its local environment, which is either sea level (the default value) or the height of the contour the item is placed in. The items can also define an optional name field. The perimeter of the AREA and LINEAR features is defined by a list of (latitude, longitude) co-ordinates, terminated by a END keyword. The POINT features are positioned with a single (latitude, longitude) co-ordinate.

The file has the following format:

```
BOUNDS
-7.75 49.75 2.0 61.0
COASTLINE
0.537056 51.517582
0.526694 51.516777
…
END
CONTOUR HEIGHT 76
-2.661771 52.332763
-2.661827 52.322707
…
END
RAILWAY LINEAR
-2.6125 54.43211
-2.612417 54.431946
…
END
LAKE
```

```
-5.627639 57.639027
-5.630944 57.637833
…
END
POPULATION
-1.331889 52.848251
-1.331306 52.845974
-1.336417 52.836945
…
END
```

As the map data is read from the file, it is automatically converted from latitude/longitude co-ordinates to an appropriate projection to give Cartesian co-ordinates. By default, the toolkit uses a Lambert projection, but any projection algorithm satisfying the Projector interface, from the geometry package, can be used.

6.4.2 File Storage Format

Although GSDK map data is defined using a generic text format, the files in which the mapping data is stored may be compressed in order to save disk space and loading time, particularly across a network or over the Internet.
The GSDK supports three map file storage formats:

a) plain text file;

b) compressed file using the GNU GZIP format;

c) compressed file using the standard ZIP format.

The GSDK differentiates between the format of the stored data by checking the file extension name. If the extension is **.zip** then the file is opened as a ZIP compressed file, and each entry in the ZIP archive will be opened and extracted as a plain text file. If the extension ends with a **z** then the file is opened as a GZIP compressed file, and extracted as a plain text file. All other files are treated as plain text. Note that there is no Java capability to open a ZIP file from within an Applet, as the Java ZIP protocol requires file access, which is forbidden under Java security rules.

6.4.3 Supplied Map files

The eDEP platform is supplied with the following map files (located in `gsdk/dat`),

- Ukcoast
  The UK coastline (no elevation data) in both zip and Z format
- Europe
  Outline map (no elevation data) of Europe
- All_Europe_Maps
  This ZIP file contains individual maps of all the countries in Europe. The file must be manually decompressed before it can be used.

7 RUNNING EDEP APPLICATIONS

7.1 INTRODUCTION

EDEP applications consist of a number of elements

- A generic main program (there exist a number under atcapp)
- Resource files which tailor this main program (usually defining the COMPONENTS resource variable).
- Other files (scenario, Java.policy) etc

The eDEP platform is packaged with an `atcapp` directory package containing a number of useful examples,

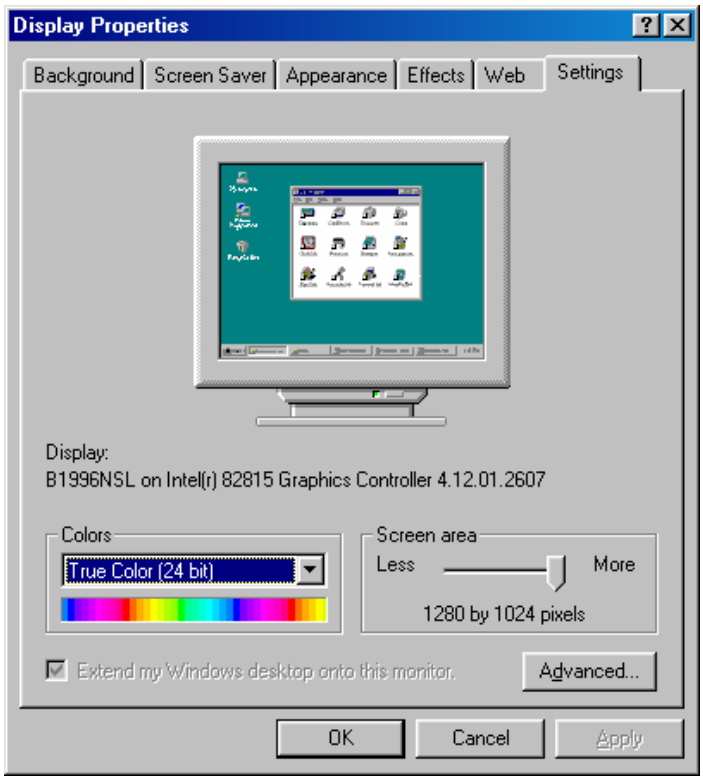
- Mono-VM, multi-CWP example
- Distributed multi-machine example
- Data recording / replay example
- Profile Validation tool example

Equally, the supplied Eclipse `.project` file contains a number of launch configurations for the above examples.

7.2 PRE-REQUISITES

7.2.1 Colour Modes

Before running Edep, the user should check that their PC's colour mode is set to True Colour (24bit); if it is not, Edep transparencies and geographic maps may not be displayed. To check and set the colour mode follow the menu sequence **Start → Settings → Control Panel → Display → Settings**. The resulting menu is illustrated below. The user should specify a value of "True Color (24 bit) for the "colors" option.

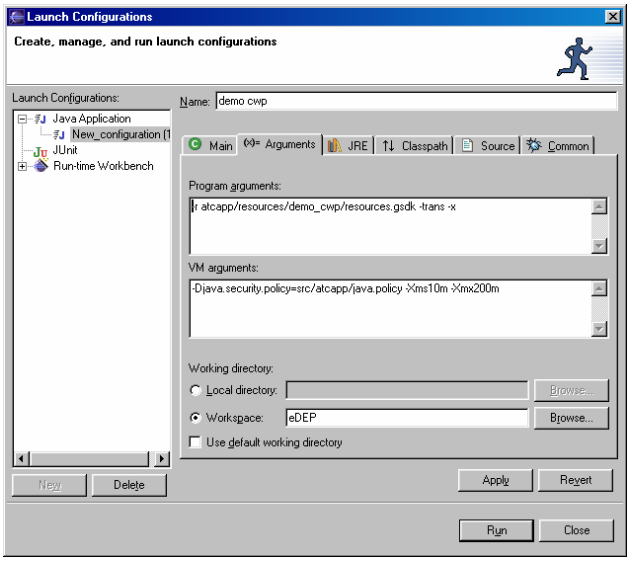


7.2.2 Launch configurations

7.2.2.1 Creating a new Launch configuration

Select the menu option **Run>Run..** and then Java Application.
The following options need to be specified:

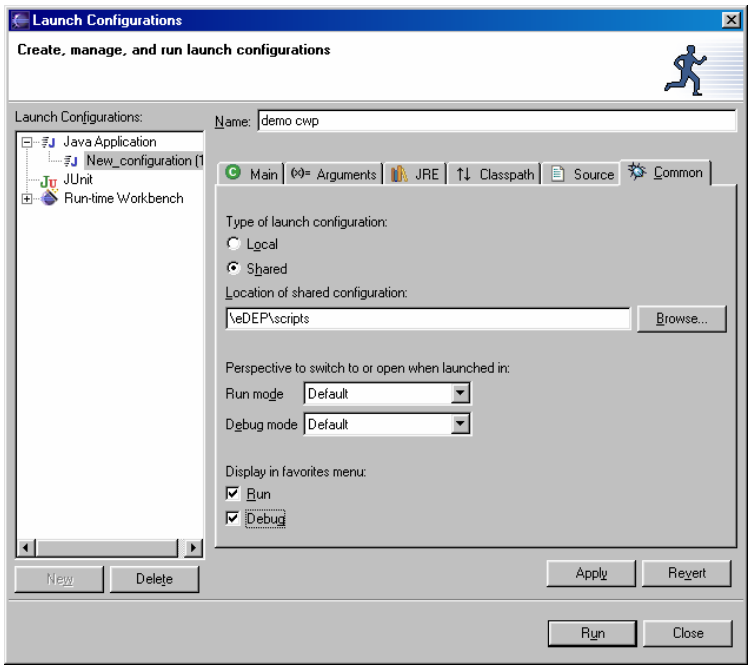
- Main class : atcapp.ATCapplication
- Program arguments, VM arguments. The recognised command line arguments are detailed in section 5.2.



The following VM arguments should be specified:

-Djava.security.policy=scripts/java.policy –Xms2m –Xmx200m

Then the launch configurations may be set-up to build standard launch scripts.



Once this process is finished, the new imported project should be displayed on screen.

7.2.2.2 Reusing an existing launch configuration

Select the menu option **Run>Run..** and then select the existing configuration.
The Edep software should now run and the user should see at least one CWP.

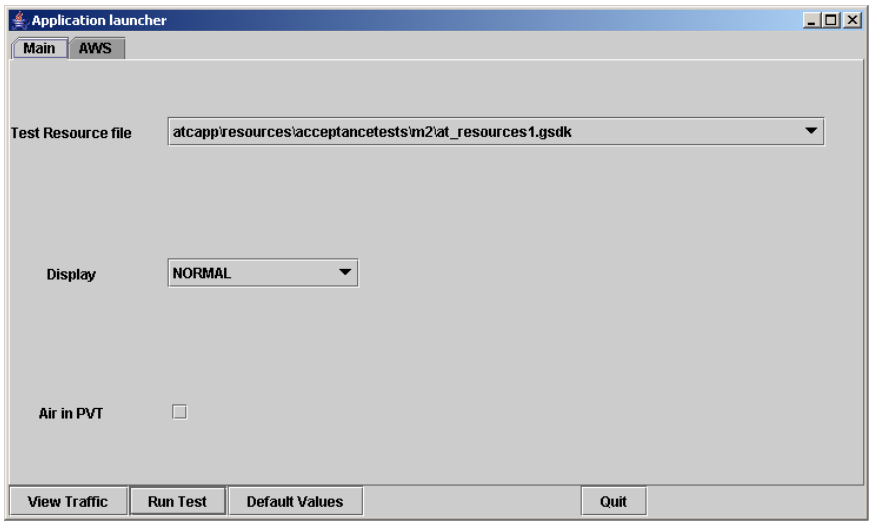
7.3 MONO-VM EXAMPLES

The eDEP project includes an Eclipse launch configuration called “ATC APP Launcher” which allows many mono-VM component tests to be run.
The launch script specifies the following VM & program arguments,

- VM arguments
  `-Djava.security.policy=scripts/java.policy -Xms2m -Xmx200m`
- Program arguments
  None.

The VM arguments are useful, specifying a pre-supplied Java policy file (not strictly necessary in a mono-VM application if collocation optimisations are set) and specifying a min and max size for the memory heap (needed for running on big screens where large amounts of system memory are required).

Once this is launched the following HMI appears



This HMI allows the following to be selected,

- The particular resource file
  (many of which are component tests)
- Display options
  - NORMAL TRUE COLOUR (PC resolution, PC true colour)
  - NORMAL (PC resolution, no true colour)
  - BARCO (i.e. 2k by 2k, no true colour)
- Air in PVT.
- AWS graphics options: Update Threshold, Volatile Images, Graphics update rate etc.

Some of these options are dependent on other options and may change automatically when selecting other options.

Once the options are set, the user has the choice of either (a) visualising the traffic in the PVT, or (b) running the scenario.

7.4 DISTRIBUTED APPLICATION EXAMPLE

For distributed applications the eDEP delivery is packaged with the following main files

- `atcapp.SimulationEngine`
  useful for running the 'core' FDPS & Timer Console . This main also runs up the central eDEP discovery server
- `atcapp.SimulationEngineClient`
  useful for running secondary components (e.g. CWPs and ATC tools). This main does not run up the central eDEP discovery server

The Eclipse project is set-up with launch configurations for the above mains. These configurations will run the resource files found in `atcapp/resources/componenttests/distributed`. Since these files set the variable `GSDK.MIDDLEWARE.DISCOVERY_HOST` to `localhost` the client should be run on the same machine (although in a separate VM) as the server.

Note : the SimulationEngine must be up and running before the SimulationEngineClient is launched. This is to ensure the Discovery Service is running.
As the number of CWP positions increases the following GSDK middleware optimisations should be considered

```
GSDK.MIDDLEWARE.MULTITHREAD_EVENT_DISPATCHING TRUE
GSDK.MIDDLEWARE.OPTIMISE_COLLOCATION          TRUE
GSDK.MIDDLEWARE.OPTIMISE_EVENT_MARSHALLING    TRUE
```

```
GSDK.MIDDLEWARE.OPTIMISE_ONEWAY_CALLS          TRUE
```

7.5 VALIDATION SCENARIO EXAMPLE

The eDEP platform is supplied with a multi-position (PWP and CWP) example, which may be run over several machines.
This validation scenario is found in `atcapp/resources/acceptancetests/validation2002`. This can be run via the above mentioned "ATC APP Launcher".

7.6 RECORDING, REPLAY AND THE MONITOR

The eDEP platform is packaged with an example of recording and replay in action (mono VM application). Refer to the resource files `in atcapp/resources/componenttests/recording & replay` for more information.

7.6.1 Recording

The data recording occurs at the CWP component level. Therefore, the supplied demonstration will cause the following binary files to be generated.

- Cwp1.log, cwp2.log
  Recording of all inter-component messages (from the CWP viewpoint)
- Cwp1_orders.log, Cwp2_orders.log
  Recording of 'significant events' occurring within each CWP

7.6.2 Replay

In order to replay the above recordings the following should be followed,

- Refresh the Eclipse project (within the package view, click right on "eDEP")
  this ensures that the above recording log files are copied over to the classes directory
- Run the replay launch configuration

This launch configuration should bring up

- A single CWP
- A Significant orders panel, listing the significant events that occurred in both CWP1 and CWP2

7.6.3 The Discovery Monitor

In order to examine which components are dispatching events, which events they dispatch and how many components are paying attention to each event, eDEP comprises the Discovery Monitor. The monitor can either be run as part of the same application launch as the rest of the software, run as a separate application on the same computer, or be run remotely.

To run it as part of the same application, simply insert this line into the component list:

```
( gsdk.middleware.monitor.Monitor, Monitor ),
```

To run it remotely or on the same computer as a separate application, create a new GSDK resource with the following code (substitute the name of the computer where the main application is running for Discovery Host – if you're not running remotely, substitute the name of your computer):

```
@LOAD "atcapp/resources/acceptancetests/validation2002/resources/common_cwp.gsdk"

GSDK.MIDDLEWARE.DISCOVERY_HOST <Discovery Host>
```

```
GSDK.MIDDLEWARE.OPTIMISE_COLLOCATION false
GSDK.MIDDLEWARE.USE_DISCOVERY_SERVER true

COMPONENTS ( (gsdk.middleware.monitor.Monitor, Monitor) )
```

When it is run, the monitor application will produce a frame with two panes – the Tree pane, and the graph pane. The tree pane can be explored to examine various aspects of the components currently running. The graph pane waits for the program to start running, then starts printing bars, representing which components are firing, and how often.

You can query specific components (to get information on each event coming from that component) by locating them in the Tree pane (under "Servers"), and right-clicking them, then selecting "Show this". Revert back to the main summary window by performing the same action on "Servers".

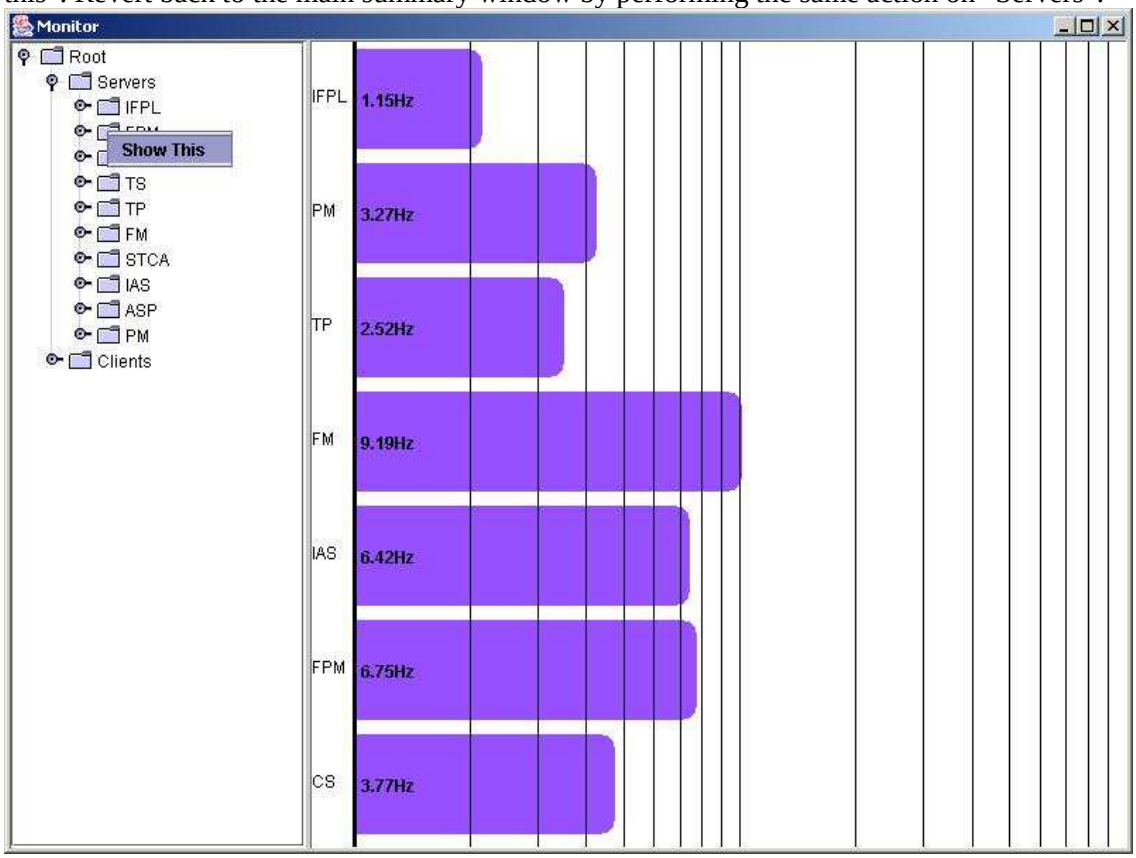


Figure 7-1 Discovery Monitor HMI

7.7 EEC APPLICATIONS

7.7.1 Data conversions

The EEC eDEP platform is complemented by the following applications,

- CFMU to eDEP converter
  Builds eDEP airspace and traffic files based on CFMU data
- XML to eDEP
  Builds eDEP airspace and traffic files from the IPAS database
- MAFF to eDEP converter
  Builds eDEP airspace and traffic files from MAFF format data. ACE2004B-bis and ACE2005A versions are supported. LOA data is not available in ACE2004b-bis version MAFF data.

The MAFF to eDEP converter extracts Airspace and Flightplan data from the following MAFF data files:-

- Airports_file.data
- airways_file.data
- atc_constraints_file.data
- flight_file.data
- holds_file.data
- letters_of_agreements_file.data
- navigation_points_file.data
- runways_file.data
- sectors_file.data
- sids_stars_file.data
- start_time_file.data
- static_display_file.data.

The converter can be used either in offline or online mode. In offline mode the data files are converted into eDEP format resource files via the eec.maff.converter.MaffToEdep application. The offline converter is shown in Figure 7-2, below. The ACE Version drop down box allows the user to specify the version of the data being converted.

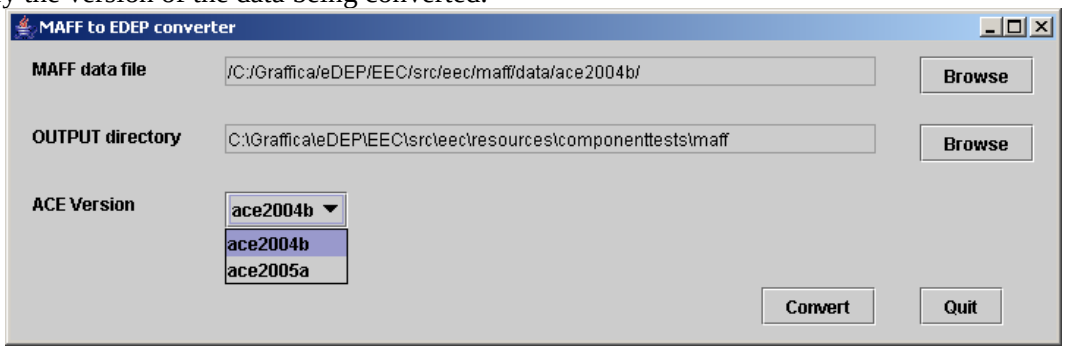


Figure 7-2 Offline MAFF eDEP Converter

In online mode the data is read directly into the platform on launch. This is achieved in the resources by specifying that the MaffScenarioReader be used in place of the standard scenario reader and the location of the data files. This has to be done for airspace and flightplans separately.

```
ASP.SCENARIO      <Directory of data files>
IFPL.SCENARIO     <Directory of data files>

ASP.SCENARIO_READER  "eec.maff.parser.scenario.MaffScenarioReader"
IFPL.SCENARIO_READER "eec.maff.parser.scenario.MaffScenarioReader"
```

```
ACE.VERSIONS ( "ace2004b" )
```

The *ACE_VERSIONS* resource parameter indicates the MAFF version of the files to be input and the MAFF version hierarchy, i.e. the *ACE_VERSIONS* resource shall be set thus:

```
ACE_VERSIONS ( <<MAFF version>>, .., .., <<eldest version>> );
```

The *MAFF Converter* attempts to load the parser corresponding to the version specified, i.e. the first MAFF version listed. If no parser is found, it searches for a parser supporting the next version. This process continues until either a parser is found or the final version is reached. The final version listed is always ACE2004A; all parsers have been implemented for ACE4A, thus a parser is always found.

An eDEP user wishing to use ACE2005A MAFF files would set the *ACE_VERSIONS* resource thus:

```
ACE_VERSIONS ( ACE2005A, ACE2004B );
```

The ACE4B data does not support letters of agreement data. To overcome this deficiency, the MAFF converter accepts will accept ACE5A letters of agreement data when converting ACE4B data.

The MAFF data conversion process is fully automated; it is not necessary to create any files manually. The following files are generated by the MAFF conversion process:

- maff.gsdk
- airspace.gsdk
- traffic.gsdk

The *maff.gsdk* file contains the START_TIME and coordination projection centre data.

7.7.2 Data Recording

The REC component (STORIA data recording) is an eDEP component which

- Builds eDEP airspace and traffic files from any STORIA XML files,
- Records significant data during simulation run in online or offline mode.

The data recorded are:

- Radar tracks,
- Conflicts,
- Pilot Orders,
- Assume/Transfer actions and
- Time events.

Radar tracks are recorded either from the PM component (normal mode) or from the IAS component (demo mode). The resource file `eec/resources/componenttests/rec/ias_as_track_event_source.gsdk` shows how to set the resources when the platform in running in demo mode.

The resource file `eec/resources/componenttests/rec/online.gsdk` shows how to set the specific resources for data recording.
If the `REC.FILEPATH` resource is set, the REC component will output the records in the specified XML file.
If the `REC.SERVER_NAME` resource is set (and `REC.ONLINE` true), the REC component will send the recorded elements to the STORIA API running on the specified server.

The REC component holds a mechanism which enables CWPs to record any data. This can be done asynchronously either by raising anonymously a `DataRecordingRequestEvent` or by calling the `DataRecordingService.recordCWPData()` method.

8 JAVA WEB START

This chapter provides a brief introduction to Java WebStart, a technology which can be employed to easily place eDEP applications on an intranet or the Internet.
The following sections provide useful hints and experiences with Java WebStart and other related products (e.g. code obfuscators).
The developer is encouraged to visit the Java WebStart web site for more information
http://java.sun.com/products/javawebstart/

8.1 INSTALLATION

The Web Start download will detail the exact installation procedure.

8.2 GENERAL

8.2.1 Development

The Java Web Start environment enables ordinary Java applications (i.e. not applets) to be downloadable across the Internet. There are, however, a number of minor programming restrictions which are summarised here -

- Use `this.getClass().getClassLoader().getResource(path);` for loading resources (image, file…). The method getSystemResource should not be used.
  In static method, it can be replaced by `new Toto().getClass().getClassLoader().getResource(path);` where Toto is the name of the class where the static method is declared.
  NOTE : For some classes (system classes), the getClassLoader method returns null. For example
  `new Object().getClass().getClassLoader()` returns **null**
- Use **this**.getClass().forName() instead of Class.forName().

Refer to the developer guide and FAQ for more information.

8.2.2 Security policy

A Java application under Web Start may be run either:

(a) within a sandbox (as with applets)

(b) outside of a sandbox (as with normal applications)

If (b) is the case, then the application must be signed, so that the end-client may accept (or not) this security risk.
Please refer to http://developer.java.sun.com/developer/onlineTraining/Security for more information.
This part of the article is interesting if we want (need) to use a Java.policy file

> When granting permissions, you can base them on who signed the code, where the code came from (the codebase), or grant them to everyone. The java.security.Permission class serves as the base class of all 1.2 permission-related classes. What an actual grant statement looks like in the policy file follows. This would allow write access to the local temporary directory, and all subdirectories recursively, for code signed by *JavaJoe* and downloaded from http://www.TrustedUserHome.foo. If an asterisks (*) was used instead of a dash (-), the permissions would be for only the specific directory, not its subdirectories, also.

```
grant signedBy "JavaJoe", codeBase
    "http://www.TrustedUserHome.foo" {
  permission java.io.FilePermission "c:\\temp\-";
}
```

8.2.3 Debugging

The following hints are given for application debugging -

- Activate Java console (Launch Java Web Start, go to Files -> Preferences, in Advanced sub menu, check Activate Java console.)
- When you are debugging, you may need to empty the cache of the navigator.
- Sometimes the application cache for Java Web Start is corrupted. Launch Java Web Start to check.

8.2.4 JNLP file example

Please note that JNLP files are very sensitive to character encoding. Under Windows, use Word Pad and save as "text only" (not MS-DOS text, nor Unicode text).
File atc.jnlp :

```
<?xml version="1.0" encoding="utf-8"?>

<jnlp spec="1.0+"
      codebase="http://pc-speech13/webstart/edep"
      href="atc.jnlp">
      <information>
            <title>GSDK Demonstrator</title>
            <vendor>Eurocontrol Experimental Centre</vendor>
            <description>ATC Application</description>
            <icon href="images/GSDK.gif"/>
            <offline-allowed/>
      </information>
      <resources>
            <j2se version="1.3+"/>
            <jar href="lib/applications.jar"/>
            <jar href="lib/gsdk.jar"/>
      </resources>
      <security>
            <all-permissions/>
      </security>
      <application-desc main-class="atcapp.ATCapplication">
            <argument>-r</argument>
            <argument>resources/atcapp/resources.gsdk</argument>
            <argument>-trans</argument>
            <argument>-x</argument>
      <application-desc/>
</jnlp>
```

Note:
If the application requires all security permission, setting the java.security.policy property for the JVM is useless. The behaviour of the application will be the same as if we use a java.policy file like this:

```
grant
{
      permission java.security.AllPermission;
};
```

8.3 JAVA OBFUSCATION

The process of obfuscation causes Java byte code to be protected against malicious attempts at reverse engineering. This is obviously of interest when placing eDEP applications on the Internet.
The eDEP project has made use of the RetroGuard product, distributed under the LGPL license, whereby no charge is made for commercial or non-commercial use of the product. It can be downloaded at http://www.retrologic.com/

8.3.1 RetroGuard scripts

The format of RetroGuard scripts is very easy to understand. They can be generated manually using scripts (with find and sed).
Here are a few useful examples:

Action	Script
Retain the name of gsdk.events.HeapObject class	`.class gsdk/events/HeapObject`
Retain all public fields and method name of class atc.cwp.server.CWPControllerImpl	`.class atc/cwp/server/CWPControllerImpl public`
Retain the name of method StartSTC(gsdk.std.STD p1) of class gsdk.entity.MobileEntityImpl	`.method gsdk/entity/MobileEntityImpl/StartSTD (Lgsdk/std/STD;)V`
Retain the name of the package resources	`.class resources/*`

8.3.2 Obfuscation constraints for EDEP

The script for obfuscating EDEP correctly (with RetroGuard) is obtained by taking into account the three following constraints.

8.3.2.1 Reflection

As we use the reflection package in several classes, we have to be careful when obsfucating.
We can distinguish 2 cases: use of "forName" and use of "getDeclaredMethod".

8.3.2.1.1 forName

If we want to be sure that all forName calls work after obfuscation, we have to keep the name of all public classes that might be loaded by reflection.
To ease this work and be sure that the reflection will always work, we decided to retain the name of ALL public classes. This solution is satisfactory because:

- The generation of the script for RetroGuard can be automated.
- The obfuscated code remains very difficult to understand

RetroGuard script generation (to keep all public classes names):

```
cd $CLASSES
find atc atcapp gsdk -name *.class | sed -e "s/.class//g" | sed
"s/^/.class /g" | grep -v '\$' >& all_classes.rgs
```

8.3.2.2 getDeclaredMethod

If we want to be sure that all getDeclaredMethod calls work after obfuscation, we have to retain the name of all methods (public) loaded like this.
We should not retain the name of all public methods of all classes because it makes the obfuscated code very easy to understand.
We should search for all uses of **getDeclaredMethod** in the project and add the appropriate line in the RetroGuard script.
For release d180202, the following classes and methods are concerned:

Class	Method
atc.aircraft.Aircraft	StartSTD
gsdk.entity.MobileEntityImpl	StartSTD

Here is the corresponding lines in the RetroGuard script:

```
.method atc/aircraft/Aircraft/StartSTD (Lgsdk/std/STD;)V
.method gsdk/entity/MobileEntityImpl/StartSTD (Lgsdk/std/STD;)V
```

8.3.2.3 RMI

We can get the name of the classes for which stubs have been generated with this script:

```
cd $CLASSES
find atc atcapp gsdk -name "*_Stub*" | sed -e "s/_Stub.class//g" |
sed -e "s/\//\./g"
```

For release d180202, the following classes are concerned :

```
atc.airspace.server.ASPControllerImpl
atc.console.server.ConsoleControllerImpl
atc.coordination.server.CSControllerImpl
atc.cwp.server.CWPControllerImpl
atc.fm.server.FMControllerImpl
atc.fpm.server.FPMControllerImpl
```

```
atc.ifpl.server.IFPLControllerImpl
atc.mtcd.server.MTCDControllerImpl
atc.tp.server.TPControllerImpl

atc.track.server.ATGControllerImpl
atc.ts.server.TSControllerImpl
gsdk.middleware.discovery.server.DiscoveryImpl
gsdk.middleware.events.DelegateRemoteListener
gsdk.middleware.events.RemoteListenerAdapter
gsdk.middleware.server.ComponentControllerImpl
```

For all these classes and the stubs, we should retain their names, and the names of all public methods and fields. We do not need to tell RetroGuard to retain the name of methods declared in the interfaces implemented by theses classes, the behaviour of RetroGuard is correct without adding specific lines in the script.
We can use these 2 shell scripts to generate the appropriate section for the RetroGuard script:

```
cd $CLASSES
find atc atcapp gsdk -name "*_Stub*" | sed -e "s/_Stub.class/
public/g" | sed  -e "s/^/.class /g"
find atc atcapp gsdk -name "*_Stub*" | sed -e "s/.class/ public/g" |
sed  -e "s/^/.class /g"
```

8.3.2.4 Main methods

Do not forget to retain methods main(String[] args)
Simplest solution is to launch Retroguard script builder with

```
java –cp retroguard.jar RGgui
```

and to keep is proposal for main methods (always click next). Use the script generated to complete your own script.

8.3.2.5 Resources

The name of the package in which the resources are stored should not be changed by obfuscations. For example if the configuration files are contained in the package resources, we should add this line in the RetroGuard script:

```
.class resources/*
.class graffica/*
```

8.3.3 Procedure

1. Compile project
2. Generate stubs
3. Make the jar:
   `jar cvf edep.jar atc/* atcapp/* gsdk/* resources/* graffica/*`
   Copy edep.jar in $RETROGUARD_HOME/jars
4. Make RetroGuard script.
   Save the script as `$RETROGUARD_HOME/script.rgs`
5. Run obfuscator:
   ```
   cd $RETROGUARD_HOME
   java -cp retroguard.jar RetroGuard jars/edep.jar
   jars/edep_obf.jar
   ```
6. Do not forget to test